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THE RELATION OF CHOKED DISK TO THE TENSION OF THE EYEBALL

AN EXPERIMENTAL STUDY *

WALTER R. PARKER, B.S., M.D.

DETROIT

In presenting the subject which I have chosen for your consideration today, I shall depart somewhat from the traditions of the section, and invite your attention to a purely medical topic.

Some years ago in an effort to collect a large number of tonometric readings in order to determine the average normal tension of the eyeball, I had the tension taken of the eyes of all the patients in the hospital and outpatient department, whenever possible. Among this number were six cases of brain tumor. Some time later when compiling the histories of the brain tumor cases, I observed that when the amount of the choked disk was the same in the two eyes, the tension was equal or nearly so, and when the swelling was greater in one eye than in the other, the tension was different in the two eyes, being least in the one showing the greater amount of swelling.

I reported these observations before the Ophthalmological Society in 1911, and have since been able to verify, in several cases, the conclusions there drawn.

During the past year I have been carrying on a series of experiments on dogs and monkeys to prove, if possible, the relation between choked disk and the tension of the eyeball, in the case of artificially increased intracranial pressure.

It is not my intention to review in detail all the hypotheses that have been advanced to explain the occurrence of choked disk in association with cerebral tumors. It is essential, however, to refer briefly to the most important of these theories, in order to make clear the reasons for our experimentation.

In general there are three principal theories advanced to account for the causation of choked disk, namely, the inflammatory, the toxic or chemical, and the mechanical. These three factors alone or in combination have been urged as the possible cause of the swelling of the disk in cases of increased intracranial pressure.

The mechanical theories of the causation of choked disk depend variously on increased intracranial pressure, increased intravaginal pressure, disturbance of return blood flow, and obstruction of lymph flow from the vitreous through the intravaginal to the subarachnoid space. The exact sequence of events, however, has not been determined. Whether or not the increased intracranial pressure must be associated with increase in the amount of the cerebrospinal fluid is still in dispute. Likewise, whether the pressure in the nerve sheath first compresses the veins and second the lymph spaces, or in the reverse order, is in doubt. Assuming that the venous engorgement occurs first, there are at least four possible points where the vein may receive its maximum compression, namely, at the lamina cribrosa, in its intraneural portion, where the vein leaves the nerve, and in the intravaginal space. Clinical and experimental evidence has been produced to influence the various authors to advance a theory as to the most important point of pressure, but there is no agreement as to the point most often attacked.

The original theory of von Graefe,[1] that the increase of intracranial pressure, caused by a tumor, acted to compress the cavernous sinus, and that this gave rise to an engorgement in the ophthalmic vein, was disproved by Seseman, who showed that the ophthalmic vein had such free connection with the facial that an obstruction to its flow into the sinus could not produce a choked disk.

The discovery by Schwalbe[2] that the intravaginal space at the optic nerve communicates with the subarachnoid space of the brain, led Schmidt-Rimpler[3] to advance the theory that when there was an increase of the intracranial pressure, a quantity of cerebrospinal fluid was pressed into the lymph space of the sheath of the optic nerve, where it produced a papilledema and a secondary venous congestion.

Manz[4] could not confirm the claim of Schmidt-Rimpler that a system of canals in the lamina cribrosa communicated with the arachnoid space, but added to the Schmidt-Rimpler theory the suggestion that, by the means of hydrops of the sheath, the intracranial pressure caused compression of the vessels in the end of the optic nerve as they pass through the lamina, which pressure resulted in an edematous swelling and infiltration. Since that time this has been known as the Schmidt-Manz theory, and according to Gowers is generally accepted in Germany as offering the most satisfactory explanation of choked disk.

Saenger holds that the sheath is first distended by cerebrospinal fluid, and as the intravaginal pressure rises, the optic nerve is compressed and the communication of its sheath with the intracranial cavity is cut off by pressure of the brain on the dural fold that surrounds the nerve at its entry into the canal. In this way, the flow of lymph in the nerve is obstructed and a choked disk results.

* This work was done with the assistance of Dr. George M. Waldeck, in the laboratories of and with material furnished by Parke, Davis & Co.

* Chairman's address, read before the Section on Ophthalmology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Von Graefe: Arch. f. Ophth., 1860, vii, 58.
2. Schwalbe: Arch. f. Mikroscop. Anat., 1869.
3. Schmidt-Rimpler: Arch. f. Augenh., 1888.
4. Manz: Deutsch. Arch. f. klin. Med., 1871, ix, 339.

Behr[5] assumes that in addition to compression of the nerve in its foramen, the lymph stasis that results compresses the vein in the nerve, and this produces the venous congestion and engorgement of the fundus.

Henderson[6] suggests that choked disk is due to the difference between the pathologically raised intravenous tension and the normal intra-ocular tension.

Fig. 1.—Photomicrograph of optic nerve of dog. Normal.

Levinsohn[7] has attempted to prove experimentally that an obstruction to the flow of the lymph in the intravaginal space compresses those lymph passages which run in the optic nerve, and that engorgement of the fluid coming from the vitreous chamber into the distal section of the optic nerve is produced in this way.

Schieck[8] maintains that the increased sheath pressure obstructs the lymph drainage along the central vessels, producing edema and swelling of the disk, and by pressure on the central vessels a secondary venous engorgement.

Parinaud[9] adhered to the mechanical theory and claimed that choked disk is present in cases of brain tumor only when the latter is complicated by hydrocephalus and edema of the brain; while Kreuchman thinks that in addition to increased pressure, the papilledema is produced by an autogenous substance set free by the destruction of the tumor cells. On the other hand, Hughlings Jackson thought that a tumor of the brain acted to a certain degree as a foreign body and excited optic neuritis by its irritating influence, and Gowers thought that it was produced through products of inflammation.

While most observers believe the mechanical theory plays an important part in the causation of choked disk, many are inclined to take the middle ground and believe that no one theory can explain all the clinical facts. This theory is well expressed by Paton and Holmes.[10] They believe the edema of the papilla that constitutes tumor papilledema is in the first place due to the venous engorgement that results from the rise of intravenous pressure that is necessary in order that circulation should be maintained in the intravaginal portion of the vein where this is subjected to an increased sheath pressure. The increased sheath pressure is also the origin of the second factor, the obstruction of the lymph drainage from the papilla.

Cushing and Bordley believe that the changes are due, first, to mechanical, and second, to toxic or inflammatory causes.

De Schweinitz says:

> In general terms, it is probable that choked disk is produced by a combination of factors. In this combination increased intracranial tension or pressure is most prominent, and the mechanical theory of its pathogenesis affords the most satisfactory explanation.

EXPERIMENTAL

The results obtained from experimentally produced intracranial pressure are as varied as the theories of the causation of papilledema in cases of brain tumor.

Levinsohn injected fluid into the subdural or subarachnoid space and observed a slight stasis in the anterior segment of the nerve, with venous hyperemia and retinal hemorrhages. He claimed the fluid never found its way along the axial trunk, even with greatly increased pressure.

Manz conducted a series of experiments on animals to determine the effect of increased intracranial pressure on the vaginal distention. Injection into the subdural space passed into and distended the sheath, and caused fulness of the retinal veins, and in some cases transient redness and swelling of the papilla.

Schieck concluded from the results obtained from his experiments that choked disk could not be caused in monkeys by placing tents in the skull; that the injection of paraffin did not cause choked disk, but when normal saline solution was injected under pressure choked disk developed. He concluded that mere rise of pressure within the skull could not cause choked disk; there must be an increased secretion of the cerebrospinal fluid.

Fig. 2.—Photomicrograph of the optic nerve of untrephined eye of dog showing choked disk. Intracranial pressure produced by digital pressure.

5. Behr: Neurol. Centralbl., 1911, xxx, 66.
6. Henderson: Glaucoma, 1910, p. 216.
7. Levinsohn: Ber. d. Ophth. Gesellsch., Heidelberg, 1911.
8. Schieck: Ber. d. Ophth. Gesellsch., Heidelberg, 1910.
9. Parinaud: Ann. d'ocul., 1879, xxxii, 5.
10. Paton and Holmes: Brain, xxxiii, 427.

Schmidt[11] found that a colored liquid injected into the sheath passed into the lymph space in the nerve at the lamina cribrosa, and he suggested that neuritis is produced not by the simple pressure outside the nerve, but by the influence, perhaps irritation, of the liquid passing into the lymph spaces.

Cushing and Bordley induced artificial intracranial

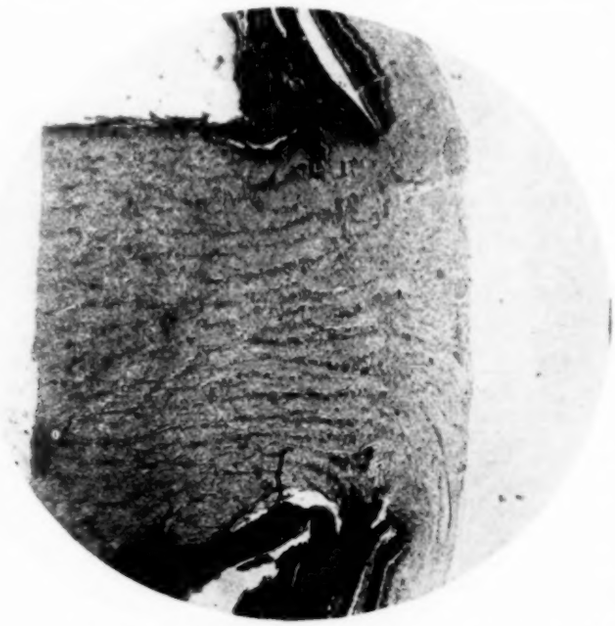

Fig. 3.—Photomicrograph of the optic nerve of trephined eye of dog showing choked disk. Intracranial pressure produced by digital pressure.

pressure by the introduction of normal salt solution in the subarachnoid space, by direct digital pressure on the dura, and by the introduction of fragments of sponge tents between the bone and dura. They concluded that a neuroretinal edema with marked elevation of the papilla may accompany conditions which raise the intracranial pressure, whether from the introduction of a new fluid under tension, or from transmission of tension to the fluid already present.

It will thus be seen that the whole subject of the pathology of choked disk, like the origin and ultimate disposition of the cerebrospinal fluid, is somewhat muddle.

With a view of determining the effect that a difference in tension in the two eyes might have on the clinical appearance, or amount of choked disk in cases of increased intracranial pressure, the following experiments were conducted:

The tension in one eye was diminished by performing the sclerocorneal trephining operation of Elliot. After recovery from the operation the intracranial pressure was increased and the effect on the two eyes observed.

The experiments were conducted on dogs and monkeys, twenty of the former and three of the latter being employed.

The details of the experiments were as follows:

The refraction of each eye was determined with the ophthalmoscope and the tension taken with a Schiötz tonometer. The intra-ocular tension of one eye was reduced by the trephining operation. After recovery from the effects of the operation a second ophthalmoscopic examination was made and again the tension recorded. Artificial intracranial pressure was induced (1) by the use of direct digital pressure; (2) by the injection of normal salt solution under registered pressure; (3) by the distention under registered pressure of an air bag introduced between the skull and dura; (4) by the injection of paraffin through a brass cannula screwed into the skull and perforated with an opening made to fit the tip of the paraffin syringe; (5) by the introduction of sea tangle tents between the bone and dura, and (6) by the introduction of sponge tents between the skull and dura.

The results will be reported in groups arranged according to material employed to produce the intracranial pressure.

GROUP I.—DIGITAL PRESSURE

Digital pressure was made on the dura, through a trephine opening. Three dogs were experimented on. In one dog, the disk in each eye was reported markedly swollen, but as the animal died before I had an opportunity to make an ophthalmoscopic examination, the result is not included in this report. In the second experiment the dog died before any marked swelling had developed. In the third experiment, the results were definite and I shall report them in detail.

A black spaniel dog, weighing 12 kg., was put under chlorbutanol anesthesia. Estimated refraction + 1.00 D. each eye, tension 18 mm. Hg. Left eye was trephined and tension reduced so low that with the 5 mg. weight the indicator on the tonometer remained to the right of the scale. Here, as in all subsequent experiments, this condition is indicated as Tn. — negative. A ¾ inch disk was removed from the right side of the skull, well back, and digital pressure applied.

At the end of five minutes' time the disk in the right eye was swollen 1 D. and in the left, the trephined eye, 7 D. with tremendous engorgement of the veins. At the end of fifteen minutes, right eye was swollen 4 D., left eye 8 D. On release of pressure for thirty-five minutes, the edema subsided to right eye 0, left eye 3 D. Fifteen minutes after the pressure was reapplied, the edema increased in right eye to 3 D., left eye 7 D. (O. D., Fig. 1; O. S., Fig. 2).

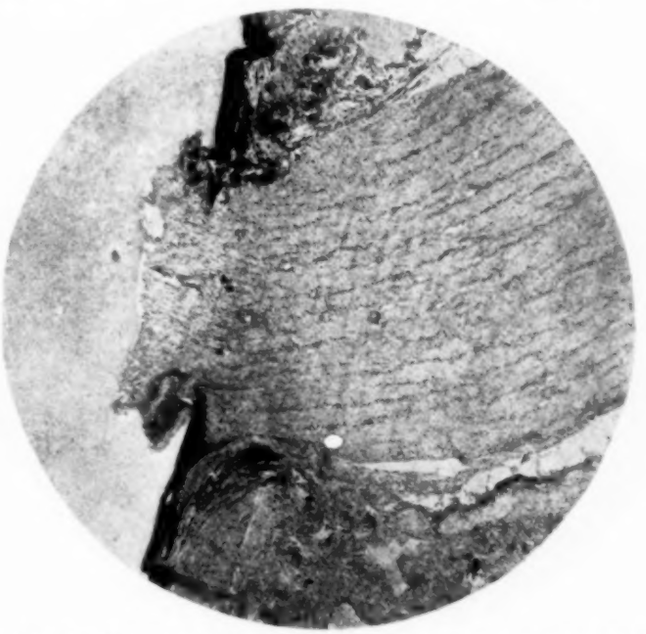

Fig. 4.—Photomicrograph of optic nerve of dog showing choked disk after intracranial injection of saline solution.

GROUP II.—A SALINE SOLUTION

A saline solution under registered pressure was injected through the trephine opening after the dura and arachnoid had been divided.

The tension in the left eye was made negative by a sclerocorneal trephining operation. At a pressure of 30 mm. of mercury, the right disk was swollen 2 D., the left 3 D. At 55 mm. pressure, each eye was swollen 6 D. At a pressure of 80 mm. an exophthalmos developed in the right eye, and,

11. Schmidt, in Gowers: Ophthalmoscopy, p. 76.

at the same time, a tremendous edema of the nerve and retina in the left eye, but no proptosis appeared. At a pressure of 110 mm. the dog died. There was practically no difference in the amount of swelling in either eye at any stage of the experiment.

Note: I am unable to explain the difference in the appearance of the two eyes unless the lack of resistance in the trephined eye permitted the fluid to escape into the globe,

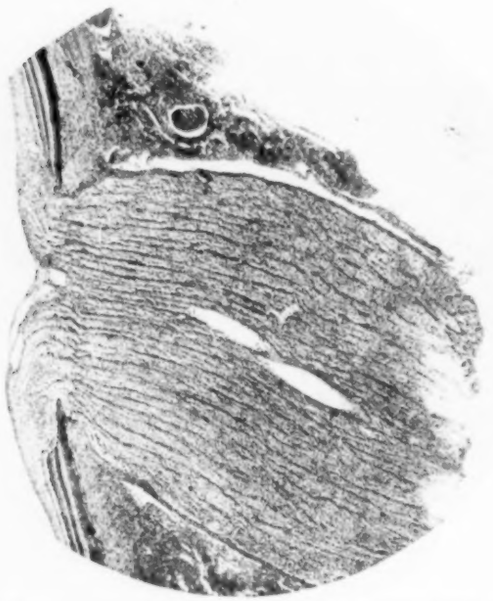

Fig. 5.—Photomicrograph of optic nerve of untrephined eye of monkey. Intracranial pressure produced by sponge tent.

whereas in the eye with normal tension the excessive engorgement in the sheath and veins led to the proptosis.

GROUP III.—AIR BAG

Pressure was made by means of an air bag attached to the end of a tube which closely fitted the trephine opening and the pressure applied under control by the means of a mercury manometer.

Three experiments were made under chlorbutanol anesthesia. The refraction was +5.00 in Dog 1, +7.00 in Dog 2, and −8.00 in Dog 3. The tension was right eye 15, left eye 18 mm. in Dog 1, 15 mm. in each eye in Dog 2, and not taken in Dog 3. In two instances the tension was reduced in the right eye by passing a suture through the cornea into the anterior chamber.

In the first case, under a pressure of 20 mm., both disks became engorged, this condition appearing first in the right or trephined eye. Under a pressure of 60 mm. the disk in the trephined eye was swollen 6 D. and in the left 2 D. Under a pressure of 90 mm. the swelling in both disks increased to 7 D., and at a pressure of 280 mm. when the dog died, the swelling did not increase above 8, and was equal in the two eyes.

Note.—The resistance at the disk is apparently increased with the amount of edema, the amount of the swelling being limited to about 8 D. While this maximum amount of swelling is reached more quickly in the eye with diminished tension, it does not go above a certain amount. This result corresponds to clinical observations.

Dog 2 died from too much chloretone.

In Dog 3, control, tension was not reduced in either eye. At a pressure of 10 mm. Hg the veins showed slight engorgement in both eyes; at 65 mm. both nerve heads became edematous. No measurable swelling appeared at 90 or 200 mm. pressure, at which pressure the dog died. Result, failure to produce choked disk.

GROUP IV.—SEA TANGLE TENT

Six experiments were made. As the early work was undertaken to develop our technic, neither eye was trephined in the first five cases. One dog died fifteen hours after the tent was introduced without reexamination. Two dogs died on the third day. One showed edema of both nerves, and the other a swelling of 1 D. in the right and 2 D. in the left disk. The fourth dog lived twelve days when examination showed a swelling of 1 D. in the right disk and 2 D. in the left. The fifth dog on the seventh day showed a swelling of 2 D. in the right disk, and 3 D. in the left.

The right eye was trephined in the sixth dog, and two pieces of sea tangle tent were introduced under the skull in the left occipitoparietal region. On the second day the disk in the trephined eye showed a swelling of 6 D. and in the left eye 3 D. Dog died same day. Postmortem examination revealed severe injury to the brain and its membranes with marked evidence of hemorrhage.

Note.—The sea tangle tent is harder and does not expand to the same degree as the sponge tent.

GROUP V.—PARAFFIN

Paraffin was injected through the cannula screwed into a trephine opening in the skull. The opening through the cannula contained a thread which corresponded to that on the tip of the syringe, so the melted paraffin could be forced directly into the brain cavity. Three tests in all were made, without opening the dura. The quantity of paraffin used varied from 3.85 to 4.42 c.c.

In each experiment the left eye was trephined and the tension made negative. The paraffin was injected on the opposite side well back (that is, in reference to the trephined eye the tumor was contralateral). In the first instance, in which 4.42 c.c. of paraffin were injected, the edema manifested itself almost immediately in the trephined eye, and not until this disk was choked 2 D. did the edema appear in the right eye. Later the venous engorgement in both eyes was intense and the edema extended to the retina. Dog died within twenty-four hours. Evidently too large a quantity of paraffin had been used.

In the second case, 3.85 c.c. of paraffin were injected. On the following day the right disk was edematous but not swollen,

Fig. 6.—Photomicrograph of optic nerve of trephined eye of monkey. Intracranial pressure produced by sponge tent.

while the left showed a swelling of 3 D. On the eighth day right eye was swollen 1 D., left eye 4 D. On the tenth day, right eye, no swelling, left eye 3 D. Dog died on the eleventh day.

In the third case, 3.85 c.c. of paraffin were injected. On the third day the right disk showed marked edema but no measurable swelling, while the left disk in the trephined eye was swollen 3 D. Dog died on the fourth day.

On the whole, the paraffin was unsatisfactory. The edema of the disk was never greater than 3 D. and subsided in a few days.

GROUP VI.—SPONGE TENTS

Four observations were made. The tension was reduced in one eye in three instances. One was run as a control, the tension being normal in both eyes. The tension in the right eye was reduced in the first dog, and that in the left eye in

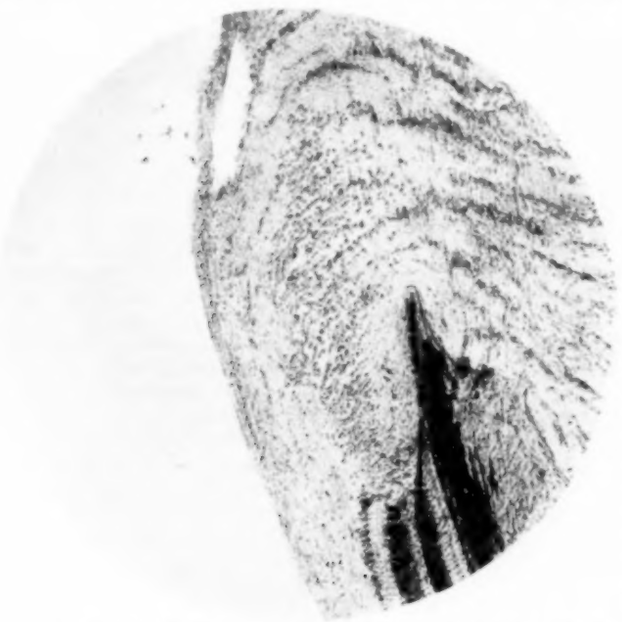

Fig. 7.—Photomicrograph showing hemorrhage in nerve shown in figure 4.

the other two dogs. In each instance the tent was inserted on the side opposite the eye with least tension.

The first dog on the second day showed edema in the left eye and a swelling of 3 D. in the right. Dog died on third day. The second dog on the second day, right eye, no swelling, left eye, + 3.00, died third day.

In the third dog, a much smaller piece of tent was inserted. On the third day, the disk in the right eye showed marked congestion, but no measurable swelling; the disk in the left, or trephined eye, swollen 3 D. On the fifth day, disk, right eye edematous, left eye swollen 3 D. On the sixth day, no change. Seventh day, disk right eye 1 D., left eye 5 D. Eighth day, same. Ninth day, disk right eye swollen 3 D., left eye 6 D. Tenth day, disk right eye 0, left eye 3 to 4, difficult to measure. Twelfth day, disk right eye 0, left eye 2 D. There was little change until the twenty-third day, when the edema in the left eye was reduced to 1 D. On the twenty-seventh day nothing but a congestion remained in the disk in either eye. On the forty-fifth day, both nerves were apparently normal.

In the fourth dog, control, tension not reduced in either eye. Estimated refraction + 2.00 each eye. Tension 25 mm. each eye. A cone of sponge tent 28 mm. high with diameter of base 9 mm. was inserted in two pieces between the bone and dura in the occipitoparietal region on the right side. On the second day the disk in each eye was congested but no measurable swelling present. On the third day the disk in the right eye was swollen 2 D., and in the left 3 D. On the fourth day the swelling had increased to 4 D. in the right and 5 D. in the left eye. Died on fourth day.

NOTE.—The results obtained by the use of sponge tent were the most satisfactory.

SUMMARY

In the nine instances in which there was a marked difference in the tension of the two eyes, there was a choked disk in both eyes in five dogs, and in the trephined eye only in four dogs. In each instance the swelling appeared exclusively or was greater in the eye of least tension.

As has been emphasized by Parsons, the return blood from the eyes in dogs is radically different from that in man, so that deductions from experiments on the canine might not be applicable to the human. It was necessary therefore to repeat the experiments on monkeys.

Profiting by our experience in the dog experimentation, we decided to subject the three monkeys we had at our disposal to the sponge tent test.

The tension in one eye was reduced by the Elliot trephine operation and in each case the tent was put in on the side opposite the eye with the least tension.

MONKEY EXPERIMENT 1.—Small Brazilian monkey, estimated refraction emmetropic, tension each eye 18 mm. Trephine operation performed on right eye. Tension after operation 6 mm. Under ether anesthesia the skull was trephined over the left occipitoparietal region and a piece of sponge tent 8 by 7 by 3 mm. was introduced between the bone and the dura.

On the second day there was a marked edema of the right disk, the left remaining normal. On the sixth day the tension was 15 in the trephined eye and all evidence of edema had disappeared. On the seventh day the trephine operation was repeated on the right eye. On the fourteenth day a second piece of sponge tent 11 by 8 by 2 mm. was introduced in the region of the first operation. On the second day thereafter, the disk in the right eye was swollen 2 D., left normal. On the fourth day the right disk was swollen 4 D., left still normal. The papilledema in the right eye remained stationary at 4 to 5 D. for ten days, and then gradually receded until the fifth day it was 2 D. While the left eye showed slight edema there never was present a measurable swelling of the disk. At this time the tension was right eye 19, left eye 25. Twenty-seven days after the last implanta-

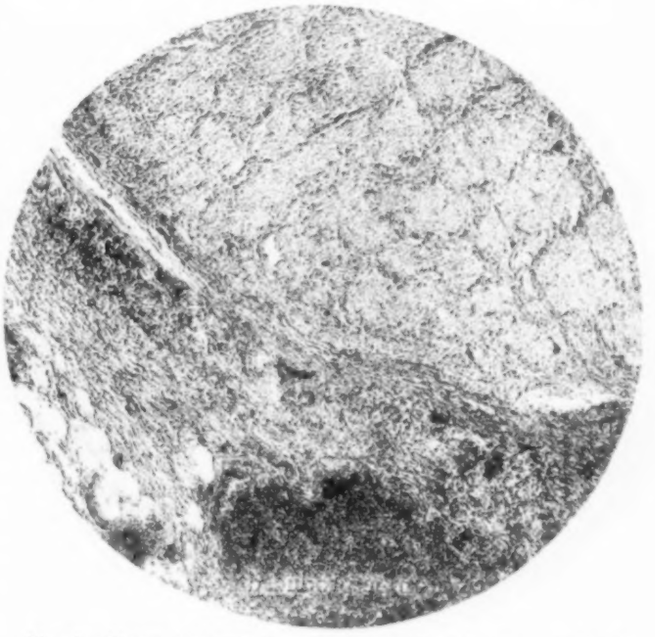

Fig. 8.—Photomicrograph showing round-cell infiltration of sheath.

tion, the trephine operation was repeated. Tension lowered to 3 mm.

Five days thereafter, without further implantation, the disk in the trephined eye again reached 4 D., while that of the left was at 0, where they still remain.

MONKEY EXPERIMENT 2.—Brazilian monkey. Estimated refraction emmetropic. Tension right eye 21 mm., left eye 21 mm. Trephine operation performed on left eye. Tension after operation negative. Under ether anesthesia the skull

was trephined and a piece of sponge tent 11 by 8 by 2 mm. was introduced between the skull and dura in the occipitoparietal region. On the second day the disk in the right eye was normal and in the left it was swollen 2½ D. On the third day, right eye edematous, left eye swollen 3 D. On the fifth day right eye 1 D., left eye 4 D. On the seventh day, right eye 2 D., left eye 6 D. Tension, right eye 21, left eye 6 D. This condition remained stationary until the fourteenth day, when the swelling began to recede, and on the seventeenth day the disk was swollen 2 D. in each eye, when the tension was 21 mm. in the right and 18 mm. in the left eye. Two days later the tension in the left eye had risen to 21 mm. Whether the recession of the choked disk was dependent on the return to normal tension in the left eye or not I am unable to say. The tension remained the same until fifteen days later, when the left eye was again trephined and the tension reduced to 0. Without further implantation the swelling in the left eye rose to 4 D. in nine days, when hemorrhages appeared on and about the disk. Tension, right eye 22 mm., left eye 3 mm. On the sixteenth day the swelling in the left eye was 5 D., right eye 0. On the seventeenth day the swelling in the left eye was 2 D., right eye 0, hemorrhage still present.

Monkey Experiment 3.—Large Brazilian monkey. Estimated refraction S + 2.00 in each eye. Tension in each eye 21. Left eye trephined under chloroform anesthesia; a large cone of sponge tent 23 mm. high and 9 mm. diameter at the base was introduced between the bone and dura in the right parietal region. On the second day the disk in the right eye was edematous, tension 21 mm. Disk in the left eye swollen 2 D., tension 2 mm. On the third day, the right disk was swollen 1 D., tension 20, left 2 D., tension 10 mm. On the fourth day right disk was swollen 2 D., left 5 D. Monkey died on fourth day (O. D., Fig. 3; O. S., Fig. 4).

Fig. 9.—Photomicrograph showing marked venous engorgement in eye of dog. Intracranial pressure produced by sponge tent.

In each experiment the intracranial pressure was made on the side opposite the eye in which the tension had been reduced. In not a single instance did the choked disk appear first on the side of the tumor but always in the eye with the least tension.

The results obtained in the dog and monkey being identical cannot, in view of the difference of the venous circulation in the two animals, but suggest the possibility that the return blood flow may not be as important a factor in the causation of choked disk as we now believe it to be.

CONCLUSIONS

1. Choked disk can be produced in the dog and monkey by artificially increasing the intracranial pressure. The most satisfactory results are obtained by the use of sponge tents.

2. When the intracranial pressure is increased by artificial tumors placed in the occipitoparietal region, one element in determining which disk will be affected first is the tension of the eyeball.

3. When the intracranial pressure is increased by artificial tumors placed in the occipitoparietal region, the nerve in the eye of least tension is the first to show the choked disk.

4. When the intracranial pressure is increased by artificial tumors placed in the occipitoparietal region, there is no direct relation between the location of the tumors and the eye first affected.

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ABSTRACT OF DISCUSSION

Dr. James Bordley, Baltimore: It has always been believed that some anatomic reason accounted for one eye swelling before or more than the other. It has also been clearly understood that as a diagnostic point in the localization of brain tumors we could not go to the eye in which there was the greatest swelling. The tumor is not always located on the side of the greater choked disk. I have studied twelve cases. I have found that where the ocular tension was equal, the side of the tumor was the side of the first swelling. Where there was a difference in the intra-ocular tension the side of the first swelling was the side of the least intra-ocular tension. This corresponds with what Dr. Parker found experimentally. In this group of cases we had one case of glaucoma. It was a one-sided glaucoma and the glaucomatous side never developed a choked disk. Of course, in considering the greatest height at the time of the examination we must also consider the condition of the choked disk; because if we examine a case in the late stages where changes have taken place in the optic nerve, it is quite possible that the side of the eye with the least tension may be the side with the greatest choked disk, because pathologic changes have taken place in the eye which have changed the condition of things.

Dr. John E. Weeks, New York: It has been held in years gone by that inflammatory processes were accountable for choked disk in some degree in all cases, and in some cases entirely so. Microscopic examination in five cases led me to conclude that a true inflammation was seldom the cause of choked disk, but that it must be due to a mechanical process, such as intracranial tension. I compiled a large number of cases observed by men in different parts of the world in regard to the difference in the degree of choked disk in the two eyes. As we all know, a great deal of speculation has been indulged in as to whether the increase in tension or increase in swelling in one eye was in any way indicative of the side on which the tumor was located. The statistics that I was able to get together showed that no dependence could be placed on that particular sign. Dr. Parker's work explains in a large degree the reason why one eye presents papilledema more than the other, namely, a difference in the intra-ocular tension.

Metabolism of the Milch Cow.—Liberal milk production, on common practical winter rations fed in quantities sufficient to maintain the live weight and to cause regular nitrogen and sulphur storage, caused consistent losses of calcium, magnesium and phosphorus from the cows' skeletons. These losses occurred in spite of liberal supplies of these nutrients in the food. The limited response of the cows to increase in the intake of these elements showed that their utilization of these nutrients, on a profitable plane of food consumption and milk production, was surprisingly inefficient.—Forbes and Beegle, *Bull. Ohio Agricultur. Exper. Sta.*, April, 1916.

REPORT OF FIVE CASES OF TERTIAN MALARIA TREATED WITH DIARSENOL INTRAVENOUSLY *

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Since 1911 various writers have published reports of the use of synthetic arsenical preparations in the different forms of malaria, which was attended usually by satisfactory results in the tertian type, but proved of little value in other types of infections. Only a few children so treated have been reported, and the writer wishes to add the brief observation of five children in the Kansas City General Hospital.

CASE 1.—Mrs. T. and her three children were admitted to the hospital on March 15, 1916. The oldest child, Gertie T., aged 11, had been ill since June, 1915, infected during residence in Oklahoma. Had chills on every third day and had had quinin treatment without permanent results. On admission to the hospital on March 15, spleen was found greatly enlarged, reaching half way to the pelvis. A thin smear of the blood showed tertian plasmodia, about one to every eight or ten fields, mostly half-grown parasites. On March 22, 0.2 gm. of diarsenol was given intravenously. No further chills or fever occurred thereafter for twenty-three days. By palpation and radiographs, the spleen showed definite reduction in size, and no organisms were found in thick smears of the peripheral blood. On March 29, 0.25 gm. diarsenol was given because of the previous small dose administered. Neither injection caused reaction. On April 15, organisms were found in the smear and on April 18, 0.4 gm. diarsenol was given. Since that time the child has gained in weight, has been symptom free, the blood sterile, though spleen is still palpable below the costal border.

CASE 2.—Jessie T., aged 9 years, sister of the preceding patient, received her infection at the same time, June, 1915; at first had attacks about every fifteen days, later chills appeared every other day. Coming under our observation, March 15, child appeared well nourished, hemoglobin 80, spleen two fingers below ribs, recently had had quinin treatment. No organisms were found in thin smears, temperature was normal for five days preceding administration of diarsenol, 0.15 gm. on March 22, and a second dose of 0.2 gm. on March 29. Child has remained afebrile and the blood sterile until the present date, June 3, 1916. This patient had been actively malarial until entering the hospital, but has showed no symptoms except the enlarged spleen since then. The spleen has receded, but not entirely disappeared.

CASE 3.—Josie T., aged 5, sister of the preceding patients, had had attacks every week since infection in the summer of 1915, with chills every other day. No results from quinin treatment. On examination, spleen tender and reaching to brim of the pelvis. Chills occurred every other day until March 22, when diarsenol, 0.1 gm., was administered, when no more chills occurred; a second dose of 0.15 gm. was given on March 29. Spleen became diminished in size. Symptoms absent thereafter until April 14, when fever and headache and organisms appeared. April 18, 0.2 gm. diarsenol was given with immediate subsidence of all symptoms. The peripheral blood was sterile six weeks later, the spleen reduced in size, but still markedly large.

CASE 4.—Maggie W., aged 10, one of five actively malarial sisters, entered the hospital April 15, 1916, suffering since June, 1915, with fever and chills on alternate days, with relapses in spite of quinin treatment. Spleen markedly enlarged, blood contained numerous adult tertian parasites, temperature every third day slightly above normal, diarsenol, 0.3 gm., was given on April 18, with subsidence of temperature; peripheral blood sterile until May 6, when organisms were again found in the blood. No further opportunity was given for treatment, as family left the city.

CASE 5.—Beatrice W., aged 7 years, sister of the preceding patient, also has been infected since summer of 1915; has had chills, fever and enlarged spleen ever since. This child had tertian parasites on admission to hospital April 15, 1916, spleen about twice the normal size. April 16 and 18 temperature rose to 104.5, accompanied by chills. Diarsenol, 0.2 gm., was given on April 18, with no further symptoms. The peripheral blood became sterile and patient left hospital. May 6, spleen could be felt two fingers below ribs, malarial organisms abundant, temperature 101. As all members of the family were infected and had become indifferent to the disease, they would not give consent to remove the children to the hospital for further treatment.

That there is room for improvement in the treatment of malaria is evident when one observes how resistant the disease often is to permanent cure by the universally administered quinin. Disappearance of chills and fever is frequently taken as evidence of a cure. If the patient feels well he will probably not return for treatment or observation.

A remedy that will cause not only an immediate disappearance of symptoms, but will sterilize the entire blood stream, reduce permanently the size of the spleen to the normal and reach what has been described as the blocked capillaries of the spleen and other internal organs and the bone marrow, will be of the greatest benefit. From the efforts of great numbers of clinicians to find such a drug, it is doubtful if many men experienced in the treatment of long-standing malarial infection believe that quinin alone can do this. Barlow[1] has recently summarized this prevalent opinion.

Soon after the discovery of salvarsan and neosalvarsan, experiments were begun with their employment in malaria, based on the fact of the common protozoal nature of the malarial and syphilitic organisms, the arsenobenzol preparations being germicidal for both.[2]

Among the cases reported in the literature in which observation has been extended over a sufficient length of time to be conclusive is one by Captain Reasoner[3] of the army who reported a subtertian malarial infection lasting twelve years, during which symptoms were present every month and quinin had been routinely administered. Following the administration of 0.4 gm. salvarsan the patient gained 8 pounds in weight within thirty days and there was no return of the malarial symptoms during subsequent observations. Goldthwaite[4] reported one case which did not yield to intramuscular injections of quinin which promptly recovered following one injection of salvarsan. Reed[5] had one patient who had had three relapses under quinin treatment, but remained cured at the end of a year following a single dose of salvarsan. Baermann[6] reports four patients with tertian malaria treated with salvarsan who were free of the organisms at the end of two months. Werner[7] and Iversen and Tuschinsky[8] observed similar results from neosalvarsan to those observed with the older preparation of arsenic when used in corresponding doses.

* Diarsenol is the Canadian preparation of salvarsan.
* Read before the Section on Diseases of Children at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Barlow: Am. Jour. Trop. Dis., May, 1916, p. 581.
2. Sheard, Charles, Jr.: London Ont. Canad. Pract. and Review, 1913, xxxviii, 591.
3. Reasoner: The Military Surgeon, 1912, xxix, 294.
4. Goldthwaite, Lieut. R. H.: Salvarsan and Malaria, Mil. Surgeon, 1912, xxxi, 455.
5. Reed, E. U.: U. S. Nav. Med. Bull., 1913, vii, 255.
6. Baermann: Experimental Use of Salvarsan in Malaria, München. med. Wchnschr., 1916, lxi, 1.
7. Werner: Ueber Neosalvarsan bei Malaria, Deutsch. med. Wchnschr., 1912, xliv, 2068.
8. Iversen and Tuschinsky: München. med. Wchnschr., 1912, xxix, 16.

COMMENT

Two of the author's patients received only one injection of the drug. This was insufficient, as organisms again appeared at the end of three weeks. In the 10-year-old child one dose of 0.3 gm. was given and in the 7-year-old 0.2 gm. was given. No opportunity was permitted for further treatment, as the parents refused to bring the children back to the hospital.

Three of the patients received from two to four injections and at one interval of three weeks organisms were again found in two children, following which the only large dose was given. These three children have since gained markedly in weight and have been continuously well. On June 3, 1916, at the last observation, the children were still free of organisms, six weeks following the last dose of the drug. All these patients had had quinin for eight months before entering the hospital. No quinin was given thereafter. The spleens have never reached normal size, but have become from one half to two thirds smaller. Because of the still definitely enlarged spleens, we do not feel that the patients can be said to be permanently cured.

Only one preparation of arsenic, diarsenol, was used, as at the time we were unable to obtain salvarsan. The dosage was probably too small, but we hesitated to employ larger doses because of the possibility of toxicity from their use. However, no reactions occurred nor any manifestation which would contraindicate the employment of such a remedy. Whether our patients would have done better on salvarsan or neosalvarsan is impossible to say.

From such a limited number of cases and a short period of observation, one cannot draw any conclusions as to the permanent curability of chronic malaria with diarsenol. Against its use in children with malaria is the somewhat greater immediate cost, the technical difficulties of administration, the fear of untoward effects, the apparent necessity for repeated doses, and in our cases, the persistence of an enlarged spleen in spite of such doses as we used. In its favor are the rapid cessation of general symptoms, the sterilization of the peripheral blood, the marked gain in weight and in health. There is a necessity for a remedy which is a parasiticide for strains of malarial organisms that are quinin fast or are not accessible to quinin. What might be accomplished with larger doses over a longer period of time, using quinin as an adjuvant, would be of interest in these cases.

The Health of Workingmen.—The United States Bureau of Mines, which heretofore has been mainly interested in the reduction of deaths by accidents among men connected with the mine industries, has broadened its scope to include the health of the men and has issued a report on health conservation at steel mills. This report contains advice of direct value to every laborer and employer of labor in the United States. The efficiency of the workmen is a subject which no operator can afford to ignore. The prevention of conditions productive of ill health is a plain business proposition. The workingman has a right to demand that he be not required to work beside men who are physically or mentally diseased. Medical supervision is necessary in order to prevent the introduction and spread of infectious or contagious diseases. Such supervision will also show defects of which employees are unaware. Large corporations should employ a full-time physician who should devote his entire attention to the study of efficiency problems. By care along these lines the average loss of time due to illness among 30,000,000 workers in the United States, estimated at nine days a year, or a loss of nearly $880,000,000, may be materially decreased.

BRONCHIECTASIS OF THE UPPER LOBES

WITH REPORT OF FIVE CASES WITH NECROPSIES *

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AND
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From etiology to treatment, the various problems which arise in connection with bronchiectasis are often a cause of difficulty. There are numerous theories as to its etiology, while as concerns the diagnosis, the figures of occurrence suggest that it is recognized twenty times more frequently by the pathologist than by the clinician. The difficulties of diagnosis are increased by the frequent association of bronchiectasis with conditions which may obscure, modify or conceal its features. But notwithstanding this, we should recognize bronchiectasis more often than we do.

SITE OF BRONCHIECTASIS

The older writers believed that the apex was the commonest site, but many modern authorities consider this erroneous and due to an imperfect differentiation of tuberculous and bronchiectatic lesions. Lebert, in a series of fifty-two cases, found unilateral upper lobe involvement in only 11 per cent. King found among the nontuberculous bronchiectases 33 per cent. unilateral and 67 per cent. bilateral, and among the tuberculous bronchiectases 46 per cent. unilateral and 54 per cent. bilateral. These figures indicate that while the tendency is to a bilateral involvement, the tuberculous cases show a greater number of unilateral cases. He found also that unilateral lesions were much more frequent on the right side than on the left. Of our unilateral cases, one was on the right and the other on the left side. King found that for all types of bronchiectasis, tuberculous and nontuberculous, unilateral and bilateral, there is a marked preponderance of cases involving all the lobes of one lung except in tuberculous unilateral cases, in which he found no example of whole lung involvement. This is interesting in connection with our Case 3, in which unilateral involvement of the entire left lung was noted. When a single lobe was involved it occurred in the upper lobe only in a small percentage of cases of pure bronchiectasis, and in a somewhat greater percentage in the tuberculous cases. In other words, according to King, lower lobe involvement predominates strikingly in all types of cases, though to a less marked degree in tuberculous bronchiectasis. This is controverted by the necropsy figures of the Phipps Institute, Philadelphia, in which upper lobe involvement predominates in tuberculous cases. Our experience leads us to believe that while lower lobe involvement predominates in nontuberculous bronchiectasis, nevertheless, in tuberculous cases, upper lobe involvement is not infrequent.

The five cases here reported are unusual in the distribution of the bronchiectasis. They came to necropsy within a period of five months, and represent the only instances of bronchiectasis in eighty consecutive necropsies from the service of the Department for Diseases of the Chest of the Jefferson Medical College.

* Read before the Section on Practice of Medicine at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

Bronchiectasis involving the upper lobes alone is not common, and only slight reference to it is found in literature. These cases illustrate particularly some of the problems of diagnosis.

REPORT OF CASES

CASE 1.—*Extensive bronchiectasis with fibrosis limited to and involving the right upper lobe. Confusion with pulmonary tuberculosis. Differentiation. Death due to lobar pneumonia.*

H. D., No. E 4437, man, white, machinist, aged 62, was admitted March 30, 1915, and died Dec. 10, 1915. His past history was negative. There was no history of syphilis. During the last ten years he had suffered with a "winter cough."

Present Illness.—This dated to one year before, when he had a severe attack of bronchitis, which occurred in the middle of winter and gradually subsided in the summer, to recur during the winter prior to his coming under our observation. Shortly after the onset he brought up 2 ounces of blood during a paroxysm of coughing. The cough on admission was moderately severe and productive, during both the day and night, of a moderate amount of thick yellowish sputum. He never had any pain in the chest, but dyspnea occurred quite constantly on exertion. He had no chilliness, fever or night sweats. His best weight was 220 pounds at the time of onset, and the present weight 174 pounds. Coincident with the loss of weight there had been a gradual diminution in strength.

Physical Examination.—He was fairly well nourished. The chest showed some flattening of the upper right half anteriorly with slight drooping of the shoulder. The superficial veins over the right upper chest and anterior surface of the right shoulder to the middle third of the arm were dilated and tortuous. Expansion on the right side was distinctly limited. The percussion note was dull anteriorly on the right side from the nipple to the third rib and posteriorly to the fourth vertebral spine. The breath sounds were generally harsh except over the area of dullness where, although their intensity was diminished, there was a distinct tubular quality. Vocal fremitus and resonance were increased, and sibilant and crackling râles were heard over the same area. There was distinct clubbing of the fingers and, to a less extent, of the toes.

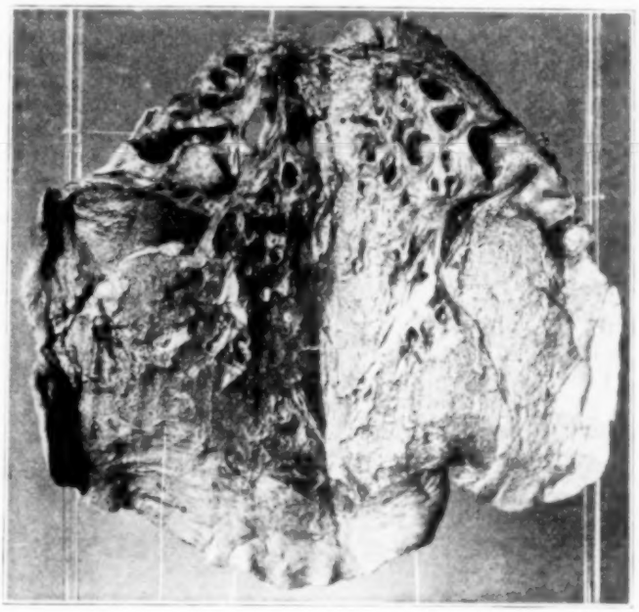

Fig. 1 (Case 1).—Right lung cut open. The sharp line of demarcation between the bronchiectatic upper lobe and the normal lung tissue of the lower lobe is the interlobar fissure. The upper lobe has been converted into a series of cavities as a result of multiple saccular dilatations of the bronchial tubes. Between the dilated bronchi the lung tissue is largely replaced by densely firm fibrous tissue. Very little air-containing pulmonary structure remains. No gross evidence of pulmonary tuberculosis could be found. The lower portions of the lung show passive congestion and slight edema. The opposite lung shows the lobar pneumonia from which the patient died.

The blood showed: hemoglobin, 87 per cent.; red cells, 4,700,000, and leukocytes, 14,000. The differential counts gave polynuclears from 55 to 60 per cent. and mononuclears 32 to 40 per cent. The Wassermann test was negative. The urine showed nothing of note, and the functional test gave 58 per cent. of phenolsulphonephthalein excretion in two hours. Repeated sputum examinations did not show tubercle bacilli. The Roentgen-ray report (Dr. Manges) was: "The right upper lobe shows a dense fibrous mass with possibly a cavity or a small amount of lung tissue left."

Progress.—Immediately after admission to the hospital the patient began to improve. The cough became less severe, expectoration lessened, his weight increased (12 pounds in two months) and his strength returned so that he was able to be up during the entire day. He had no elevation of temperature, except for occasional rises to 99 and 100. He was discharged on request and admitted to a sanatorium during the following summer months, where the diagnosis of *advanced tuberculosis* was made. He was readmitted under our care in the autumn considerably improved, afebrile, but still suffering from a distressing cough and considerable expectoration. The physical examination was identical with that of previous admission. It was our opinion that he suffered with a localized nontuberculous fibrosis of the right upper lobe with perhaps some bronchial dilatation giving rise to signs of cavity. The opposite lung was clear. He was feeling particularly well when an attack of lobar pneumonia with involvement of the left lung supervened from which he died in three days.

Remarks.—The principal reasons for excluding tuberculosis were the apparent freedom from involvement of the left lung in the presence of so well marked a lesion in the right upper lobe and the absence of tubercle bacilli in the sputum. He had been in three sanatoriums; in each the diagnosis of advanced tuberculosis was made. In one sanatorium no examination of the sputum was made.

Necropsy (Dr. Dry. Only the relevant findings are reported in this and subsequent cases).—Lobar pneumonia of left lung. The right pleura was thickened and densely adherent over the upper lobe only. The upper right lobe showed marked fibrous change and cavities throughout due to multiple saccular dilatation of the bronchi. No evidence of tuberculosis.

CASE 2.—*Bronchiectasis involving the upper portions of both lungs, associated with a chronic ulcerative tuberculosis of the same area with small cavities. The bronchiectatic dilatations were in excess of the tuberculous cavities. The impossibility of diagnosing bronchiectasis under these conditions.*

L. S., No. D 5237, man, white, pedler, aged 58, was admitted May 27, 1914, and died Jan. 24, 1916. The past history was negative. He denied having had syphilis.

Present Illness.—Ten years ago he applied to a local hospital for treatment for "bronchial trouble" characterized by a constant annoying cough with expectoration which at times was blood streaked. Since then he had never been entirely free from cough except for very short intervals, usually in the summer months. He had been a patient in various hospitals and sanatoriums with the diagnosis of tuberculosis. At the time of admission to our care his cough was moderately severe and productive, especially at night, of a large amount of yellowish sputum. Blood spitting occurred on numerous occasions, never amounting to more than streaked sputum and rarely lasting more than a day or two. Hoarseness was present at various times. The appetite had been fair, but digestion poor. His best weight was 124 pounds at the time of onset ten years ago, his lowest weight 99 pounds six months ago, and present weight 104 pounds. He had generally lost strength, although feeling better at times; on admission he was quite weak.

Physical Examination.—He was poorly nourished and pale. The thorax was somewhat rounded and emaciated. The right side was smaller than the left and flattened anteriorly over the upper half. The percussion note was hyperresonant over the entire chest anteriorly except below the right clavicle to the

second rib; posteriorly resonance was impaired from the apexes to the spine of the scapulae on both sides and over the right base from the angle of the scapula downward. The breath sounds were generally tubular throughout except below the fourth rib anteriorly, where they were bronchovesicular, and posteriorly below the angles of the scapulae, where they were distant, especially on the right side and corresponding to the area of dulness. The breath sounds on the left side in the upper half were of a typical amphoric quality. Abundant râles of all types were heard throughout the entire pulmonary area, with greatest predominance in the upper lobes, especially on the right side. Vocal fremitus and resonance were quite distinct over the upper chest, especially in the right side and diminished at the right base. The extremities did not show clubbing.

The blood showed: hemoglobin, 70 per cent.; red cells, 4,400,000; leukocytes, 11,000 to 18,000. The polynuclear count varied from 64 to 76 per cent., and the mononuclears from 24 to 36 per cent. Wassermann test was negative. The urine had a low specific gravity with albumin and hyaline casts. Phenolsulphonephthalein output varied from 29 to 40 per cent. in two hours. The sputum contained large numbers of tubercle bacilli.

Temperature Record.—Except for a few months, he was under constant observation from May, 1914, to January, 1916, when he died. For the greater part of this time he was afebrile, except for an occasional week when he would have a slight afternoon rise in temperature for several hours, not exceeding 99 to 100, and, still more rarely, an acute "flare up" to 101 or 102 for several afternoons. The third hour temperature during the last month of life was rarely above normal, and during the last two weeks was subnormal with diurnal oscillations of 2 and 3 degrees. The bedside chart stood in marked contrast with those of fellow patients manifesting the irregular fever so frequently found in advanced tuberculosis.

Progress. — The clinical course was one of progressive weakness until the final month of life, when he was generally confined to bed. The cough was at all times distressing and productive. Blood streaked sputum was frequent and transient in duration. His death, though not unexpected, occurred rather suddenly.

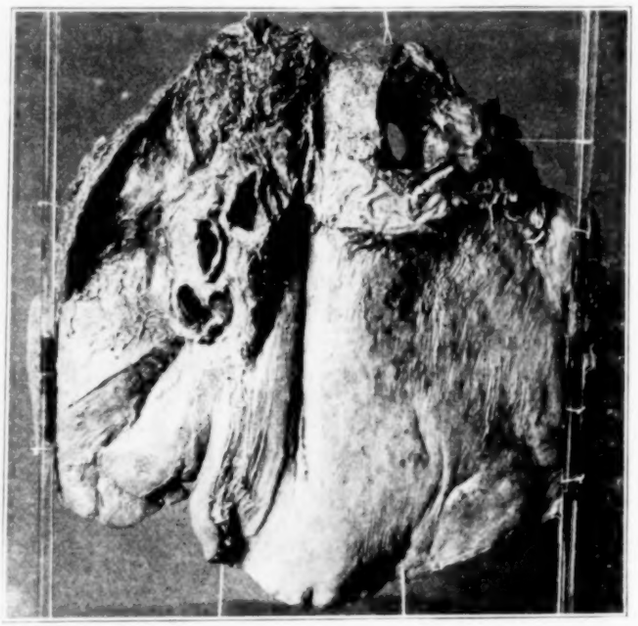

Fig. 2 (Case 1).—External view of same lung as in Figure 1. In the upper portion is seen a trap door of tissue cut in the posterior wall of the largest saccular dilatation exposing to view the interior and the distal wall with the opening of the bronchus therein. The pleura over the upper lobe is thickened and was densely adherent, causing some laceration of the lung tissue during removal. The pleura over the lower lobe is smooth, glistening and apparently normal.

Necropsy (Dr. Dry).—Marked thickened adherent pleura on both sides. Cavities throughout the upper portions of both lungs with marked fibroid changes. The bronchiectatic were in excess of the tuberculous cavities.

CASE 3.—*Extensive bronchiectasis and tuberculosis limited to the left lung. A large cavity in the upper lobe with saccular bronchiectasis of the upper and lower lobes. The question at necropsy as to whether the large apical cavity was tuberculous or bronchiectatic decided only after a careful study by the pathologist. Diagnosis of bronchiectasis suspected during life.*

V. D., No. D 2425, woman, white, mill-worker, aged 20, admitted Nov. 6, 1913, died Feb. 29, 1916. There was a family history of tuberculosis. The previous history was negative.

Present Illness.—The onset was about two years ago with cough and weakness. She was sent to a state sanatorium where she remained for six weeks. She kept house until one year ago when she returned to work in a mill, where she continued until one month ago, when she stopped because of cough and hemorrhages from the lung. The cough of late had become more and more severe and productive of considerable yellowish white sputum which was often blood streaked. The first hemorrhage amounted to a "basinful." She had no pain, but there was dyspnea on exertion. Chilliness and fever were frequent, and night sweats occurred every now and then. Her best weight was 107 pounds three months ago, weight at present 72 pounds.

Physical Examination.—An ill nourished, emaciated, pallid young adult woman. She had moderate dyspnea with slightly cyanotic lips. The chest was flat and emaciated with accentuation of the bony prominences and depressions. The respirations were rapid and shallow with general limitation, especially of the left side. Bronchial fremitus was distinctly felt over the entire left lung. Percussion revealed a slight quality of tympany on the right side anteriorly and posteriorly to the fourth thoracic spine, below which the note was impaired; on the left side dulness extended from the apex to the fourth rib anteriorly, and there was impaired resonance over the entire surface posteriorly, except from the second to the fourth rib, where it approached tympany. Breath sounds were loud and tubular over the entire pulmonary area, especially on the left side, where from the clavicle to the third rib anteriorly and between the second and fourth spine posteriorly, they were distinctly amphoric. Scattered râles of all types were found throughout the lung, especially on the left side. The extremities did not show clubbing.

The blood showed: hemoglobin, 65 to 70 per cent.; red cells, 5,400,000 to 4,300,000; leukocytes, 14,000 to 18,000. The polynuclears varied from 66 to 80 per cent. and mononuclears 18 to 28 per cent. The Wassermann test was negative. The urine was clear. The sputum contained tubercle bacilli.

Progress.—After staying in the hospital under observation for eight months the patient felt slightly better and was transferred to a sanatorium in the country. The cough, expectoration and fever remained unchanged. Hemoptysis was frequent, usually in the form of blood-streaked sputum, but on several occasions it was so profuse as to be alarming. The third hour temperature record showed constant afternoon elevations to from 101 to 103 with rapid pulse. After the lapse of one year she returned in about the same condition, but physical examination showed that the left lung was more extensively involved and the right lung considerably improved. We could not account for these changes in the physical signs, except that possibly many of the previous findings in the right lung were due to an associated nontuberculous process which had cleared. We were at a loss to explain the signs of extensive involvement with cavity formation on the left side and so little involvement on the right side. In the ward classes it was pointed out that "perhaps an associated unilateral bronchiectasis" was present. The patient became weaker and had arthritis of the left knee in the last three months of life. The hemoptyses, so frequent on the first admission, were entirely absent. The temperature showed marked diurnal oscillations. Death resulted from lobar pneumonia of the right lung on the second day of its course.

Necropsy (Dr. Dry).—Lobar pneumonia of the right lung, which showed no signs of tuberculosis. The pleura was thick-

ened and adherent over the whole of the left side. The upper lobe of the left lung showed a large cavity with a fibrous wall at the apex and numerous smaller cavities due to bronchiectasis. At necropsy it was not possible to say whether the large cavity was tuberculous or bronchiectatic. The subsequent studies in the pathologic department by Dr. Coplin established its tuberculous nature. Throughout the remainder of the upper lobe and through the lower lobe there was a diffuse, saccular and cylindric bronchiectasis. The lung showed no gross evidence of tuberculosis, although microscopic sections from numerous areas revealed chronic caseous tuberculous bronchitis, fibrocaseous peribronchitis, caseous pneumonia, incomplete atelectasis, and fibrosis. Many of the bronchi showed a deficiency or absence of cartilaginous tissue suggesting faulty bronchogenesis.

CASE 4.—*Well marked acute tuberculosis of recent onset involving both lungs. No signs of cavity formation, yet necropsy revealed a bilateral bronchiectasis of limited extent in both upper lobes.*

E. D., No. F 2055, man, white, farmer, aged 27, was admitted Oct. 21, 1915, and died March 10, 1916. An abscess of the neck (tuberculous glands?) had been opened two years before. There was no history of syphilis.

Present Illness.—The onset was two months before with pain in the throat, hoarseness and cough. These increased in severity; the cough was productive of a considerable quantity of blood streaked sputum. He had lost 42 pounds in weight. On admission he complained of chilliness, fever and night sweats.

Physical Examination.—He was pale and emaciated. The larynx was red, and cords swollen and extensively ulcerated (tuberculous). The chest was flat and emaciated with limited expansion. The percussion note was generally dull except above the right clavicle and over the same area posteriorly, where it was distinctly impaired. The breath sounds were generally harsh with prolonged expiration most marked in the upper part of the lungs. Distinct cogwheel breathing was audible over the left base posteriorly. Scattered crackling râles were heard over the upper halves of both lungs. The extremities showed beginning clubbing of the fingers and toes.

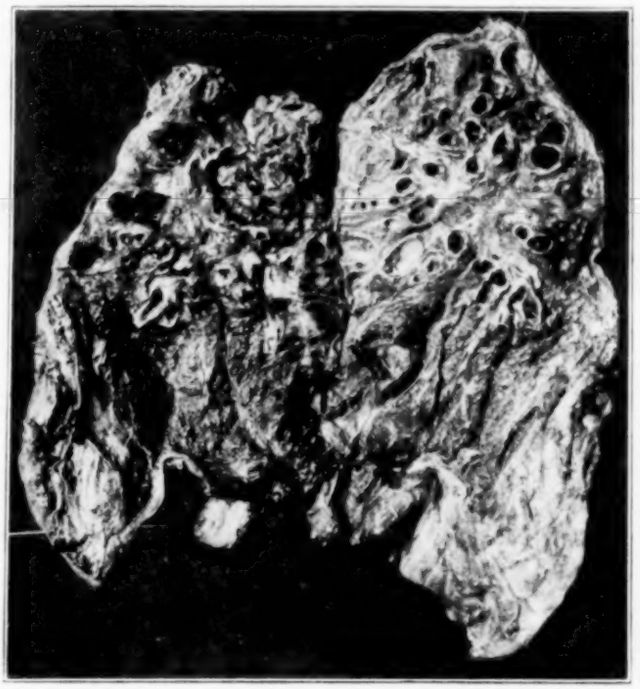

Fig. 3 (Case 2).—Right lung. The upper half of lung shows advanced bronchiectasis. The dilatations are for the most part saccular, although cylindric in some areas, as illustrated on the left side, where the bronchus has been split in its long axis. The bronchial walls are not only dilated, but at points markedly thickened. The lesion corresponds probably to the type described as dilatation with thickening in contradistinction to dilatation with thinning. The intervening tissue is dense and firm, and here and there can be found small fibrocaseous areas, not only throughout the bronchiectatic area, but also in the lower lobes. A small tuberculous cavity can be seen in upper right of specimen at apex. The pleura overlying the upper half of the lung was densely adherent and irregularly thickened.

The blood showed: hemoglobin, 67 per cent.; red cells, 4,700,000, and leukocytes 16,000. The polynuclears were 88 per cent. and mononuclears 12 per cent. The Wassermann test was negative. The urine showed albumin and hyaline casts. The sputum did not contain tubercle bacilli.

Progress.—From the time of admission the course was progressively downward with weakness, irregular fever, night sweats, pain in the throat, hoarseness, shortness of breath and difficulty in swallowing. He died as the result of progressive asthenia.

Necropsy (Dr. Dry).—There was marked pleural thickening over the apexes of both lungs, more marked behind. Both upper lobes showed fibrosis and many dilated bronchi. Throughout both lungs there were many miliary tubercles. There was a tuberculous cavity at the left apex.

CASE 5.—*Bilateral apical bronchiectasis associated with bilateral ulcerative tuberculosis. Adhesive pleuritis with fibrosis of the lungs. The recognition of both conditions during life.*

M. B., No. F 2060, man, white, aged 30 years, was admitted Oct. 29, 1915, and died May 17, 1916. One brother, at present in good health, was treated for tuberculosis some years ago. The past history was negative.

Present Illness.—The onset occurred two years ago with an attack of pleurisy, since which time he has had a moderately severe cough with expectoration of moderate amounts of mucopurulent sputum, at times blood streaked. He is frequently dyspneic, especially on exertion. He has been losing strength gradually, until at present he is unable to work. His best weight was 120 pounds five years ago, and his present weight is 104.

Physical Examination.—The chest was markedly emaciated and showed a deep depression of the lower sternum and right half. The expansion was generally limited, especially on the right side. The percussion note approached tympany above and below both clavicles. The breath sounds were generally harsh with prolongation of expiration and at both apexes anteriorly and posteriorly distinctly cavernous in character. There were numerous râles of all types over the entire chest, especially at the apexes. The extremities did not show clubbing.

The blood showed: hemoglobin, 74 per cent.; red cells, 4,510,000, and leukocytes, 13,600; lymphocytes, 22 per cent.; polynuclears, 76 per cent.; eosinophils, 2 per cent. The urine showed a trace of albumin with a few hyaline and granular casts. The sputum was positive for tubercle bacilli. The Wassermann test was negative.

The Roentgen ray (Dr. Borzell) showed extensive bronchiectasis involving both upper lobes with marked fibrosis. On the right side as far down as the seventh rib the pleura was very much thickened; considerable infiltration of the right lower lobe.

Progress.—For six months the condition remained unchanged. He was discharged on request and readmitted May 4, suffering from a profuse hemoptysis. The hemorrhage gradually ceased, but he became progressively weaker, and died, May 17. The diagnosis of chronic pulmonary tuberculosis with bilateral cavity formation with associated bronchiectasis was made both by the clinician and the roentgenologist and confirmed by necropsy.

Necropsy (Dr. Dry).—Both pleural cavities were completely obliterated by adhesions, especially dense over the apexes. In removing the lungs, apical adhesions caused tearing of pulmonary tissue. The lungs showed extensive fibrosis in the upper lobes with numerous small cavities, which mostly were saccular bronchiectases; in each upper lobe there was a distinct tuberculous cavity about 3 cm. in diameter.

BRONCHIECTASIS IN RELATION TO SYPHILIS AND TUBERCULOSIS

Syphilis was long considered an important factor in the "pneumopathies" until Laennec showed the unity of the anatomic lesions of tuberculosis. There-

after tuberculosis assumed the greater importance. Recently Tripier and other French writers have argued on anatomic and clinical grounds that syphilis is the cause of the majority of cases of bronchial dilatation. They exclude those cases due to foreign bodies or stenosis and the group with cylindric dilatation generalized in one or both lungs which is observed in infants and more rarely in young subjects under the influence of repeated attacks of coughing and following various lesions causing compensatory dilatation. Abecassis[1] reported thirteen instances of bronchial dilatation associated with other syphilitic lesions such as aortitis, aneurysm, tabes, etc. Garin and Laurent[2] found the Wassermann reaction positive in five cases which they studied. In our five cases the histories were entirely negative, no evidences of syphilis were present, and the Wassermann tests were negative. We have not been able to find in the literature any reference to the finding of the *Spirochaeta pallida* in this type of pulmonary lesion. While syphilis is a possible factor in some cases, most students of the disease are of the opinion that it is not the important factor which the French writers emphasize.

With regard to the relation of tuberculosis to bronchiectasis, we have the extreme views of Rokitansky, who considered the two diseases almost incompatible, and Trojanowsky and King, who found tuberculosis in twenty-one out of sixty-eight, and in twenty-five out of seventy cases, respectively. In our five cases, tuberculous lesions were associated in four instances. King[3] classified seventy cases of bronchiectasis occurring at the Brompton Hospital as follows: (1) "pure bronchiectasis," those associated with tuberculosis, thirty-six cases; (2) "traumatic bronchiectasis," those resulting from aneurysm, tumor, foreign bodies, syphilitic stricture, nine cases; (3) "tubercular bronchiectasis," those associated with tuberculosis, twenty-five cases. Expressed in percentage, nontuberculous bronchiectasis occurred in 66 per cent. and tuberculous bronchiectasis in 34 per cent. of the seventy cases. With regard to the "tuberculous bronchiectasis," King is of the opinion that all of these cases were primarily tuberculous.

Moderate degrees of bronchial dilatation are not infrequently found associated with pulmonary tuberculosis at necropsy; but clinically the association can be demonstrated only rarely, even when fairly well marked. A probable explanation is found in the fact that when bronchiectatic lesions exist with tuberculosis, they are most frequently found in the upper lobes, and are confused with signs due to tuberculous excavation. A comparison of the clinical and pathologic reports of the Phipps Institute, Philadelphia, is interesting in this connection. Among 3,551 patients with tuberculosis, only 5 were complicated with bronchiectasis; among 320 necropsies, bronchial dilatation was frequently found and distributed throughout the lungs as follows: left upper lobe, 40; right upper lobe, 48; right middle lobe, 31; left lower lobe, 28; right lower lobe, 24. The etiologic relationship of the two lesions is emphasized by the relatively greater frequency of involvement of those portions of the lungs where tuberculosis usually has its initial and most extensive lesion.

Fig. 4 (Case 2).—Left lung. The bronchiectasis is of the same character as in the right lung (Fig. 3), though not quite as extensive. Its sharp limitation to the upper portions of the lung is striking. On the right side of specimen where hook is inserted a rather large cavity is seen, the wall of which presents the usual appearance of a tuberculous lesion. In the lower portions of the lung are numerous conglomerate tubercles. The pleura overlying the upper lobes is thickened and at time of necropsy was quite firmly adherent.

In the cases here reported it is important to decide, if possible, whether there is any clue to the etiology. So far as the histories are concerned, in no case did the disease seem to follow any severe infection. Certain causes seem unlikely to be of importance, especially those which affect the whole of the lung structure. Thus the mechanical pressure of secretion, increased air pressure, atrophy of the bronchial wall, alteration of nutrition, paralysis of the fibers, nervous causes, do not seem likely to operate so locally. But certain other causes may have a definite influence. Among those are pneumonia, tuberculosis, extrabronchial traction, most often caused by pleural adhesions to the thoracic wall and fibroid changes in the lung, a local inflammation of the bronchi, and bronchial stenosis (from a foreign body, pressure of aneurysm or tumor, gumma of a bronchus). In general we must agree with Ewart that there must be some elementary factor common to all varieties, and this is obstruction in some form. Traction on the bronchial wall may arise from a peribronchitis or from a chronic adhesive pleurisy which extends inward. In either case if the process extends so that there is a connection between the bronchial and chest wall, dilatation may follow.

Certain of these possibilities seem to be definitely excluded in all and others in some of our cases. A foreign body, aneurysm or tumor, gumma or syphilis in any form are ruled out. The possibility of pneumonia is difficult to exclude in any case merely from the history, but changes resulting from pneumonia are more important than the pneumonia itself. Tubercu-

1. Abecassis: Lyon thesis, 1910.
2. Garin and Laurent: Jour. physiol. et path. gén., 1910, xii, 553.
3. King: Scot. Med. and Surg. Jour., 1904, xiv, 42, 481.

losis was present in four of our cases. However, what seems most important in this series was the condition of the pleura. In all but one the adhesions were limited to the lobe or lobes with bronchiectasis. This must be regarded as an important etiologic factor. However, it should be said that some regard the fibrosis and pleurisy as secondary phenomena to the bronchiectasis. In any event the frequent association of bronchiectasis and fibrosis is agreed on, and as fibrosis is recognized more frequently, its presence should always suggest careful study of the possibility of bronchiectasis.

CLINICAL FEATURES AND DIAGNOSIS

The features of the marked general cases are usually such that a diagnosis should be made readily enough. The problem is a more difficult one in cases of local bronchiectasis. The history may be of help, especially in any detail which suggests the possibilities of a foreign body having gained entrance to a bronchus, but of particular importance is a history of a chronic cough for a long period with considerable expectoration *without marked constitutional disturbances*, especially if the sputum is fetid. The cough being paroxysmal and often induced by change in position is also suggestive. Too much stress should not be placed on the odor of the sputum; in four of our cases there was no marked fetor of the sputum. This may be due to the fact that in apical bronchiectasis there is better drainage and consequently not the degree of retention common in basal bronchiectasis. The presence of blood in the sputum is not diagnostic, as it occurs with the same frequency in tuberculosis. It was present in all our cases. The sputum in a marked case is usually characteristic in amount and character, but in our cases it was not distinctive except at times in Case 1. Dyspnea is common, especially on exertion, and is most marked in cases with considerable fibrosis.

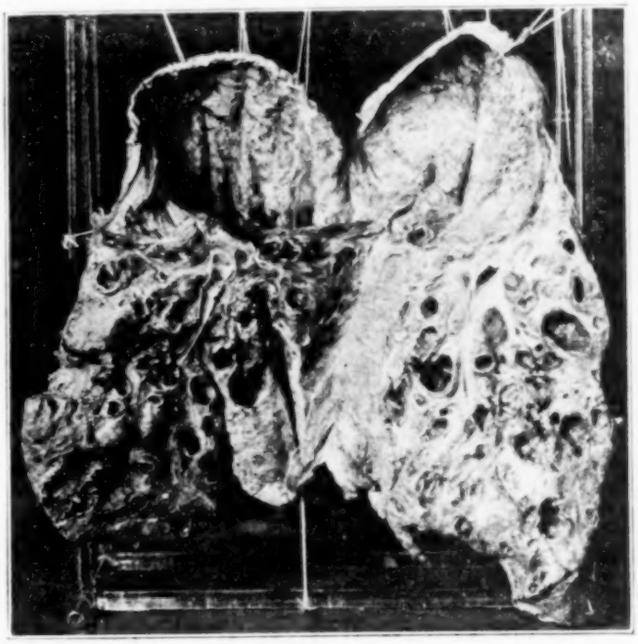

Fig. 5 (Case 3).—Left lung. The apex of the upper lobe is converted into a single cavity with a thin, densely firm fibroid wall composed largely of thickened pleura. Microscopic sections of the wall are largely fibrous tissue. The lower portion of the upper lobe and all of the lower lobe are transformed into a series of cavities which intercommunicate in a remarkable fashion. These cavities are bronchial dilatations. The opposite lung showed a lesion of lobar pneumonia at necropsy, and was free from tuberculosis. A discussion as to the character of the large cavity, whether tuberculous or bronchiectatic, or both, is contained in the text.

The problem of diagnosis of these upper lobe cases of bronchiectasis is largely that of differentiation from tuberculosis. When the two exist together, a diagnosis of bronchiectasis is practically impossible and, if made, an exact diagnosis as to how much of the change is due to this condition and how much to tuberculosis is still more difficult. The nontuberculous cases are often regarded as tuberculosis, an error which can be made only through carelessness. The sputum of a patient with advanced pulmonary lesions due to tuberculosis always contains tubercle bacilli. If this was recognized, we would not miss so many cases of chronic nontuberculous lung conditions and call them tuberculous. It would be interesting to know how many such there are in tuberculosis sanatoriums today, with a diagnosis of advanced pulmonary tuberculosis but no tubercle bacilli in the sputum. The first case here reported is an example (the patient was in several sanatoriums with an invariable diagnosis of tuberculosis). It sounds elementary, but evidently requires emphasis to insist that when symptoms and signs point to advanced pulmonary tuberculosis, and repeated sputum examinations do not show tubercle bacilli, the condition is not tuberculosis.

Another point which may aid in diagnosis is the disproportion between the signs in the lungs and the constitutional symptoms (likely to be present if the condition is tuberculosis). This is not invariable, for many tuberculous patients show the same thing; but when present over a long period, it should suggest careful study of the possibility of bronchiectasis. This was a striking point in Case 1.

The belief that in the diagnosis between a tuberculous and a bronchiectatic cavity the apical position of one and the basal position of the other may be considered as almost positive evidence cannot be accepted. We believe that too much importance has been given to this because bronchiectasis with tuberculosis is perhaps more often apical than basal, and because apical nontuberculous bronchiectasis, either unilateral or bilateral, is probably more common than the usual teaching suggests.

Roentgenographic study, particularly by the stereoscopic method, should be practiced in every case with the hope that in the future this diagnostic aid may be developed. At the present time, however, most students of the disease have the opinion that the Roentgen ray is of comparatively little value in the diagnosis of bronchiectasis. In the demonstration of foreign bodies, aneurysm, etc., it has a distinct field of usefulness.

Treatment is largely palliative. The adoption of a semierect or erect posture facilitates drainage in the apical cases. After intratracheal injections the patient should be placed in a recumbent posture. Autogenous vaccines may be tried, although their value is undetermined. The general measures are those usually applied to improve the nutrition of the patient.

SUMMARY

1. In five cases of apical bronchiectasis, the distribution was: right upper lobe, one; right upper and lower lobe, one; both upper lobes, three.

2. Tuberculosis was associated in four cases, three of which were bilateral.

3. Syphilis was apparently excluded as an etiologic factor.

4. Pleural thickening over the site of the bronchiectasis was extreme in all and limited to the area of bronchiectasis in four. This suggests an important etiologic influence.

5. There was marked evidence of pulmonary fibrosis in the bronchiectatic areas.

6. The diagnosis is difficult, but possible more frequently if looked for in the presence of fibrosis or tuberculosis with which it is not uncommonly associated. Advanced apical bronchiectasis unassociated with tuberculosis may be mistaken for tuberculosis, which error can be avoided by careful sputum examination.

7. The absence of fetid sputum in these cases was probably due to the fact that drainage is more thorough in upper lobe cases.

ABSTRACT OF DISCUSSION

Dr. Frederick T. Lord, Boston: As regards the pathology, bronchiectasis is a striking feature at necropsy and the impressive picture it presents may lead us to consider it of primary importance, but we should think of it, as close examination of the lungs almost invariably shows, as a relatively insignificant part of a more or less extensive bronchopulmonary involvement. Concerning the diagnosis: It is at times very difficult to distinguish between bronchiectasis and chronic abscess, and it must be acknowledged that we cannot always make this differentiation. In the presence of such extensive bronchopulmonary lesions as we have seen illustrated in the photographs shown, this is of less importance than in other clinical cases in which the lesions are of limited extent, as indicated by physical signs and Roentgen examination. In such cases a decision between bronchopulmonary infection leading to bronchiectasis and chronic pulmonary abscess may be the deciding factor between nonoperative and operative treatment. The presence in the sputum of elastic tissue with alveolar arrangement indicates involvement of the lung tissue and a loss of pulmonary substance but does not exclude a complicating bronchiectasis.

When the differential diagnosis cannot be established it seems best in the presence of limited and circumscribed involvement to give the patient the benefit of the doubt and consider operative interference.

POSTURE IN OBSTETRICS *

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NEW YORK

Stimulated by a most interesting paper on the "Significance of Posture in Obstetrics" by the late Dr. Albert F. A. King of Washington, I began in 1909 the study of its effect in the different stages of labor. Up to that time I had been in the habit of having my patients grasp the foot of the bed or the back of a firm chair with both hands, and then during the pain squat down so that the knees pressed against the side of the uterus and the entire weight of the contents of the uterus was directed on the dilating cervix. In the more intelligent class of patients this was comparatively easy to accomplish, but in the less intelligent and highly nervous type, they either refused to assume the position or sank down on the floor. It therefore came to me that if I could provide a suitable chair I would gain my point of bringing the weight of the uterine content so that it would exert its force to the best advantage in dilating the cervix and parturient canal.

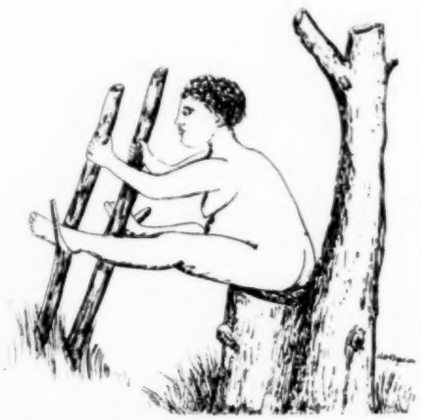

Fig. 1.—Primitive obstetric chair used by native African women. (This and the following eight illustrations are taken from G. T. Witkowsk's "Histoire des accouchements chez tous les peuples," 1887.)

Before beginning the construction of this first chair I looked up the literature on the subject and found it so interesting that I shall give a brief abstract of what I found.

The antiquity of the obstetric chair, according to the opinion of Fugelmann, is that the earliest possible reference to it in our possession dates back to Moschion, a Greek physician of the second century. Comments on the use of the obstetric chair are scattered through the writings of several Greek physicians, such as Aetamidoe, Aëtius, Toranus of Ephesus, and Paulus of Aegina. The latter states that the time has come for the mother to be placed on the chair when palpation has shown the uterus to be open and when the infant is about to be born.

Fig. 2.—Chair after model of Savonarole, 1747.

Fig. 3.—Obstetric chair used in Oriental countries.

Fig. 4.—Obstetric chair of Deventer, 1800.

Until its reappearance in the middle ages, there is a gap in the history of the obstetric chair, which is again

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

encountered in the writings of Albertus Magnus, in the thirteenth century.

Eucharius Rhodion relates that the midwives of France and Germany had special seats, rather low, with an empty space to allow the child's passage, and a rounded support to receive the back of the extended mother. This chair was packed and stuffed with linen from behind, for after the patient had taken her seat, the midwife was to have free space to do her work on either side of the seat. Since the middle of the sixteenth century, this chair was in common use in Germany, but was not recommended for stout women, for whom the kneeling posture was considered more desirable.

An obstetric chair built after the model of Rhodion's chair was recommended by Rueff in Switzerland ("De Conceptu et Generatione Hominis," 1554). Many years later, this book was translated into English, "For the General Good and Benefit of this Nation":

Let the stoole be made compassewise, underpropped with four feet, the stay of it being behind bending backward, hollow in the midst, covered with a blacke cloth underneath, hanging down to the ground, by that means that the laboring woman may be covered and other women sometimes apply their hands in any place, if necessity requires. Let the stoole be furnished and covered with many cloths and clouts at the back and other parts, that the laboring woman receive not hurt, or the infant anywhere, strongly kicking and striving because of the pains, stirrings and motions of the mother.

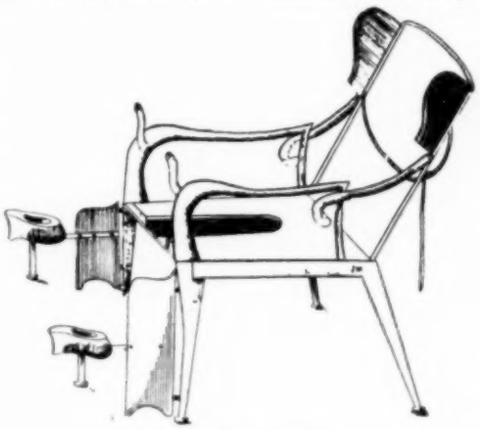

Fig. 5.—Stein's model.

Favorable mention of the obstetric chair is also made by Ambroise Pare, who in his "Œuvres" (1564) points out that its usefulness should not be underrated:

The chair should not be higher than two feet above the floor. The pregnant woman reclines in it on her back, so that her inspirations are free. The sacrum and coccyx are exposed and in no way separated. The same is true for the pubes, the thighs being spread apart, which moreover facilitates the manipulations of the midwife seated in front of the pregnant woman. A cushion should be placed in the hollowed back of the chair, and some padding under the thighs to contribute to the woman's comfort.

The seventeenth century finds the obstetric chair installed in an honorable place in the center of medical erudition. As an auxiliary in childbirth, Jacques Duval (1612) recommends a chair of moderate height, 1½ to 2 feet, open both in front and behind, so that the midwife has unhindered access to the parturient woman. This chair should have a sloping pillow, on which the patient can recline at ease and rest during the intervals between her pains; it should be upholstered or stuffed with cushions, so that the seat and thighs are comfortable. In front of the chair should lie a large cushion for the woman to kneel on when the pains begin; she may rest her hands on the chair and clasp it tightly while she holds her breath, thereby endeavoring to push the child down.

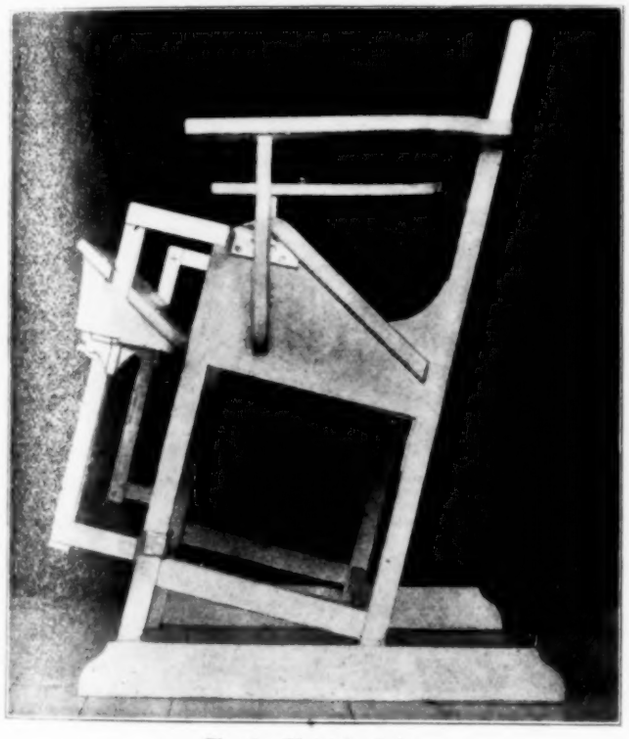

Fig. 6.—Obstetric chair.

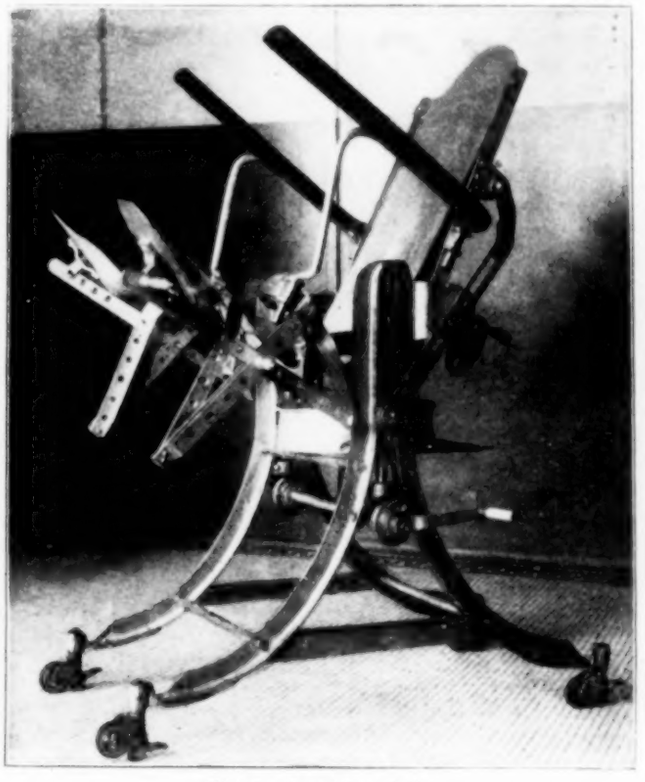

Fig. 7.—Operating chair.

The obstetric chair was frequently employed by Flemish women in Belgium, in the eighteenth century, and the leading accoucheurs vied with one another to construct a chair of their own invention. The model of Dr. Herbiniant, about 1780, was distinguished by a foot board attached to the chair by leather straps, and

a woolen insert which could be fitted into the concavity of the obstetric chair, after this had served its particular purpose. In Holland, the employment of the obstetric chair was at one time so entirely customary that this useful article formed part of the outfit for all fairly well equipped brides. Englishwomen, in the eighteenth century, made use of a specially constructed wooden chair, with a seat scooped out in front, to facilitate the passage of the child.

Fig. 8.—Rocking chair.

From an originally simple piece of furniture, the obstetric chair was developed, in the eighteenth century, into more complicated contrivances by Deventer, whose so-called perforated chair was at one time very popular. This adjustable but somewhat clumsy chair was even provided with an arrangement to keep the occupant's feet warm, by means of hot ashes and sand bags. Heister, in the eighteenth century, recommended the use in labor of seats analogous to Rhodion's obstetric chair. Stark, in 1791, advocated a model devised by himself. Stein, in Marburg, Germany, toward the end of the eighteenth century, extolled a rather complicated structure, of his own invention, which had separate parts united by hooks and hinges so that it could be taken entirely apart. All the pieces, including the pads, could be packed in a medium sized chest, to be carried about or sent to a distance. This chair could be adjusted at different heights, by means of iron bars held in place with screws. It was provided with arm pieces or handles, and had a sloping footboard. The entire arrangement was such that the flexed legs of the seated or reclining occupant of the chair necessarily formed an acute angle with the thighs, thus enabling her to move and propel an extraordinary weight with a minimum expenditure of strength.

In the Western hemisphere the obstetric chair gradually fell into disuse, although it survived some time in rural communities of various countries. At the present writing, the nations of the East are its patrons, and it is found in Japan, China, Greece, Turkey and also Syria, Egypt and Palestine. In the last named country, according to Engelmann, it is still an honored institution, often seen in the humble form of an old fashioned armchair. In Syria, all self-respecting midwives own their obstetric chairs, built on the plan of a rocking chair, with arms and a seat scooped out in front, about 2 feet above the rockers, and cut out in a semicircle. The women of the Orient are also delivered in a special chair, the separate parts of which fold up like ordinary folding chairs. Among the wealthy these seats are made of ebony and inlaid with mother of pearl. The midwife does her work kneeling in front of the parturient woman. Among the modern Egyptians, the midwife makes use of a chair which is covered with a shawl or an embroidered napkin; and some flowers of the Henna tree, or roses, are tied with an embroidered handkerchief to each of the upper corners of the back; thus ornamented the chair is conveyed before the midwife to the house.

In several villages of Africa, a delivery chair is found, consisting of a block of wood which rests against a tree, at a height of about 3½ feet above the ground. Two stilts are driven into the ground on either side to serve as foot rests, and the woman makes her efforts at expulsion while taking a firm hold of the ends of the stilts with both hands. It would seem to the author that this might almost be taken as the type of the primitive chair. Thus it is seen that for many centuries the use of some sort of device for maintaining the upright posture has been used throughout the world. With the introduction of forceps the necessity of posture was gradually lost sight of, so that at the present time but little is said in its favor, and the pendulum has swung so far to the other extreme that we are in danger of having our women all delivered by operative procedure of one sort or another. Forceps and other operations are resorted to daily by many practicing obstetrics with but little more reason than that the patient has been in labor longer than appears necessary.

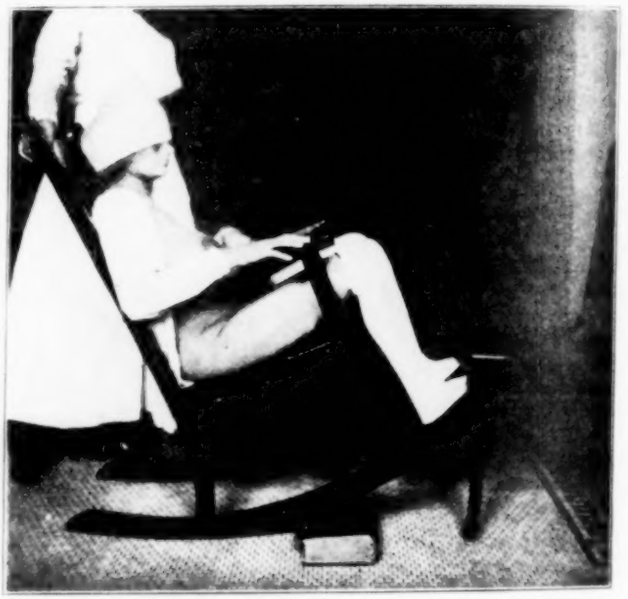

Fig. 9.—Rocking chair.

I would strongly urge that the first stage of labor be observed more carefully than it has been in the past and that obstetricians, both in hospital and private practice, exert their efforts to making this stage as short as is comfortable with perfect safety to both mother and child; for by so doing much suffering will be spared the mother, and the accoucheur will husband

his time, first by instructing the woman how to make the best use of her pains, instructing her to hold her breath and bear down when the pains are weak and ineffectual or in case of a strong rapidly recurring uterine contraction to open the mouth and use as little as possible the auxiliary muscles of expulsion. In both of these the use of posture will be of great assistance. In the weak pains the sitting posture will allow

TABLE 1.—BABIES, TWINS AND STILLBIRTHS

	Number	Babies	Twins	Stillbirths
Primiparas	282	282	5	5
Multiparas	38	37	...	1
Total	320	319	5	6

the weight of the uterine contents to bear steadily on the cervical zone, slowly dilating the parts by the force exerted by the bag of waters, whereas in the case in which the contractions are severe the patient may possibly recline to better advantage than by walking about or sitting in the chair. Again, in moderate degrees of pelvic contractions the chair will be of great advantage, allowing full dilatation to take place before the patient has become worn out by long continued efforts and the consequent thinning out of the lower half of the uterus with the not infrequent contraction of the ring of Bandl which, when carried too far, will mean an impossible delivery by normal process. Even in the second stage in old primiparas, the chair may be used to great advantage to dilate the rigid pelvic floor. Of course here the greatest care must be used not to carry it too far.

It has never been intended that the patient should be placed in the sitting posture at the beginning of labor and continued in that position, but rather that it be used to rest the expectant mother's efforts and allow the weight of the liquor amnii to do its part to the best advantage. Each case must be judged by itself, the patient going from the bed to the chair or walking about as is most comfortable for her, and yet bringing the first stage of labor to an end in the shortest time possible without risk.

A search of the textbooks on obstetrics on the subject of posture shows that the sitting posture is but little considered as an aid to labor.

Williams says:

During the first stage of labor the patient usually prefers to move about the room, and frequently is more com-

TABLE 2.—ANATOMIC CONDITIONS

	Normal Pelvis	Abnormal Pelvis	Total
Primiparas	226	56	282
Multiparas	29	9	38
Total	255	65	320

fortable when occupying a sitting position. During this period, therefore, she should not be compelled to take her bed unless she feels so inclined, and when she does so she should be cautioned against attempting to hasten labor by voluntarily bringing her abdominal muscles into play, for they have little or no effect on the dilatation of the cervix, and the effort will only serve to exhaust her strength. In the latter part of the first stage the pains generally become so severe that the patient instinctively seeks the recumbent position; but if she is still moving about the room or sitting up, she should go to bed immediately on rupture of the membranes and the beginning of bearing down pains.

Cragin says:

On the other hand it is only fair to the patient that she should be visited and carefully examined by her obstetrician as soon as her labor is well started and that he should remain with her during her second or expulsive stage and for at least an hour after the birth of the child. After a careful examination during the first stage, experience will usually indicate to the physician how long he can safely be absent and engaged in other work without being needed by the patient, and if there is a well trained nurse in attendance, and especially if he can communicate with her by telephone, he is often enabled, during the first stage, to devote several hours to other work. He should always hold himself in readiness, however, to come at once to the patient's house on the call of the nurse. During the first stage it is a good rule not to encourage the patient to use her abdominal muscles during uterine contractions as it usually does little good, and by forcing the undilated cervix downward it tends to loosen the fascial support of the anterior wall and favors the development of a cystocele. During the first stage, unless it occurs at night, the patient should be encouraged to be up and walking about, as engagement of the presenting part and dilatation of the cervix are favored by the upright position. She should not be allowed, however, to become fatigued by excessive walking. If the first stage begins at night the patient, after the examination of the obstetrician,

TABLE 3.—HOURS DURING WHICH PATIENTS WERE KEPT IN CHAIR

Number Hours in Chair	1 or Less	2	3	4	5	6	7	8	Not Recorded	Total
Spontaneous	45*	64	49	16	5	7	..	4	5	199
Low forceps	5	3	4	..	1	1	..	..	1	15
Medium forceps	1	2	3	1	..	1	1	..	..	9
High forceps	..	..	..	1	..	..	..	..	..	1
Version	1	3	1	1	..	..	1	..	1	8

* Of these forty-five, in 1 case 15 minutes, 7 cases 30 minutes, 1 case 35 minutes, 4 cases 40 minutes, 5 cases 45 minutes, 1 case 55 minutes.

should be advised to get some sleep if possible, so as to have her strength for the demands of the morrow.

DeLee says:

The treatment of the first stage is one of watchful expectance. The duty of the accoucheur is to observe the efforts of nature, not to aid, until she has proven herself unequal to the task. Only when nature fails is art to enter. Nothing is so reprehensive as meddlesome midwifery. It has cost thousands of valuable lives. Attempts to hasten the dilatation of the cervix, either manually, by bags, or by having the woman bear down may not be made. Premature bearing down efforts of the mother aid very little in the first stage; further, it is distinctly harmful, since the child is forced down before the dilatation of the os, overstretching the broad ligaments and laying the foundation of a future prolapsus uteri. Let the parturient woman walk around the room, the admission of dust into the vagina being guarded against by a large sterile pad and a T-binder. She may rest at intervals on a couch, lying on her back or on the side to which the occiput is directed.

Peterson says:

During the first stage of labor, there is little to be done beyond the moral support of the patient. All necessary preparations have been made for the final moments of the delivery. All that is necessary at this time is for the physician to ascertain the nature and position of the presentation, and to assure himself of the normal conditions of affairs. During this stage the bowels and bladder must be emptied by the methods already described. The patient must be impressed with the necessity of conserving her strength at this time. To this end, she should remain in her chair

or bed, according as to whether it is day or night, occasionally walking around the room in order to bring the action of gravity into play, thereby stimulating the uterus to more efficient contractions. In most women and especially those with relaxed abdominal walls, much valuable assistance will be afforded at this time by the wearing of an abdominal binder. This should be closely fitted to the abdominal protuberance. It affords a certain amount of support to the woman, and stimulates the womb to more energetic contraction. After the labor has progressed sufficiently to result

TABLE 4.—ABNORMAL PELVES

	Primiparas	Multiparas	Total
Contracted outlet	14	1	15
Very projecting spines	1	..	1
Flat pelvis	9	1	10
Justo minor flat	..	1	1
Justo minor	21	..	21
Funnel (male) type	2	..	2
Flat with projecting spines	1	..	1
Generally contracted	8	5	13
Right Nägele	..	1	1
Total	56	9	65

in a cervical dilatation of from 4 to 5 centimeters the patient should be confined to her bed in order to avoid the possibility of a precipitate escape of the child.

They all agree that the woman should walk about and even sit in a chair, but its actual value in shortening the time of labor is not touched on. The one objection, the use of the abdominal muscles during the uterine contractions by the woman bearing down, I heartily agree with when the pains are strong, but this applies to her while she is walking around the room as well as when she is sitting in a comfortable chair, where she is much less likely to attempt such efforts and at the same time the pressure of the bag of waters is exerting its best efforts.

I believe that every obstetric patient should have the "test of labor," however abnormal the existing condition may be. If I may be pardoned the enthusiasm which only a practical experience can give, I should go further and say, with special reference to the abdominal cases encountered in obstetric work, that no opportunity should be lost, no deviation from the normal too great, to try the obstetric chair if for no other rea-

TABLE 5.—DELIVERY

	Spontaneous	Low Forceps	Medium Forceps	High Forceps	Version	Breech Extraction	Cesarean Section	Total
Contracted outlet	4	3	6	..	..	1	..	14
Very projecting spines	..	..	1	..	..	..	..	1
Flat pelvis	4	..	3	..	1	..	1	9
Justo minor	8	..	7	..	2	3	1	21
Funnel (male) type	..	1	1	..	..	..	..	2
Flat with projecting spines	..	..	..	1	..	..	..	1
Generally contracted	5	3	..	..	..	..	..	8
Total	21	7	18	1	3	4	2	56

son than the dilatation of the cervix. We must not expect the impossible, such as a spontaneous delivery of a large baby in a markedly contracted pelvis or in cases of grave deformity with presentations impossible of delivery where all sorts of bad handling already handicap any procedure. But the obstetric chair has certainly justified itself in our experience by shortening the time of labor with benefit to mother and child, to say nothing of the time saved to the accoucheur.

In an earlier article I suggested that a folding chair might be improvised which could be constructed of such material that its sterilization might be easily accomplished and of such small size that it might be folded up and carried from case to case. As yet this has not been easy to do, and I have therefore turned to the rocking chair found in every home that can be made into an excellent obstetric chair. Our method of using the chair is as follows: When regular contractions have been established, the patient is instructed to conserve her strength by not remaining too long in one position, but to sit from time to time in the chair with the knees elevated so that they support the enlarged abdomen and to have the chair so padded with pillows, blankets, etc., that the maximum of comfort is afforded. In such a chair, if her pains are weak, she may comfortably sleep for half an hour or more, and the accoucheur will be satisfied by the fact that the weight of the uterine contents is being exerted on the cervix, not in a harmful way but with a steady hydrostatic pressure that at this stage does more to shorten the labor than anything else. If she becomes restless in the chair or the contractions are severe, she may with benefit walk about the room or even recline

TABLE 6.—PRIMIPARAS WITH NORMAL PELVES

Delivery	No.	Average Time in Chair	Stage When Put in Chair		Average Duration of Labor, Hrs.	Progress in Chair		
						Good	Fair	Poor
Spontaneous	193	2	157	36	12	178*	12	2
Low forceps	15	1¾	14	1	22	9†	3	1
Medium forceps	9	2½	8	1	28	2‡	4	1
High forceps	1	4	1	..	25	..	..	1
Version	8	3	7	1	22	5§	..	1

* One not recorded; 1 inertia.

† Of these fifteen: 1 right occipitoposterior presentation; 1 eclampsia; 1 lobar pneumonia; 9 weak pains—inertia; 3 not recorded.

‡ Of these nine: 1 left occipitoposterior presentation not rotated; 2 prominent spines; 3 rigid cervix; 2 inertia, weak pains; 1 not recorded.

§ Of these eight: 2 right occipitoposterior presentation; 1 cord prolapsed; 1 twin; 1 eclampsia; 1 inertia; 1 no advance; 1 not recorded.

Again, the inclination of the chair is of the greatest importance, as in old multiparas with an abdominal wall so relaxed that the uterus is completely antiflexed in the upright position. A binder should be applied and the chair so tipped back that the axis of the uterus will point directly downward into the pelvis.

That the chair should be used with discretion, I most certainly believe; but that rule applies to all medical procedures.

Since I began to use the chair, I have performed fewer operations, such as cesarean section, versions, forceps, etc., and a study of my statistics shows an improvement, there being a decrease in deaths of mother, fewer stillbirths and fewer deaths of children following labor. As far as perineal lacerations go, it has not apparently affected them as far as can be seen in the few cases collected, and I believe that where lacerations or other complications of a similar nature do occur, the fault lies with the accoucheur in not controlling the progress of the child through the parturient canal in time to prevent such accidents.

The statistics in Table 1, based on 320 cases, include 179 reported in September, 1915.

From the standpoint of anatomic conditions encountered, Table 2 is of interest.

Table 3, arranged under the headings of hours during which the patients were kept in the chair, is of interest. A consideration of this table and the explana-

tory note shows that in about 20 per cent. of the cases labor lasted only one hour or less after the patient was put in the chair. In one case fifteen minutes apparently sufficed, though here the cervix was almost fully dilated at the time, while in eighteen cases in which the cervix was only 1 or a few fingers dilated, less than one hour was required.

In the next group of cases, the patients with abnormal pelves, Table 4 gives the important features.

TABLE 7.—DELIVERY

Pelves	Spontaneous	Forceps	Cesarean Section	Total	Average Time in Chair	Average Duration of Labor
Generally contracted	3	1	1	5	1½	16
Contracted outlet	1	..	..	1	2	13½
Flat	1	..	..	1	1	38
Right Nägele	1	..	..	1	4½	5½
Justo minor flat	..	..	1	1	2½	13
Total	6	1	2	9	....	....

If we consider the primiparas in this group and their behavior with the obstetric chair, we observe the data given in Table 5.

Considering the first portion of this table, namely, the primiparas with normal pelves, an analysis and consideration gives the features presented in Table 6.

Reference to the last part of this table, that referring to the progress in the chair, taken in conjunction with the notes appended, shows that interference was necessary in six cases because of abnormalities of fetal position: 3 right occipitoposterior presentation, 1 left occipitotransverse presentation, 1 prolapsed cord, 1 twin; and in 8 cases because of abnormalities in the mother: 1 lobar pneumonia, 2 eclampsia, 2 prominent spines, 3 rigid cervix.

In the remaining nineteen where operative interference was resorted to, excluding five where notes of the progress were not made, there were fourteen cases where uterine inertia prevented delivery.

It will thus be seen that in twenty-one primiparas where conditions anatomically might have presupposed, or rendered necessary, operative interference, spontaneous delivery occurred. In other words, in about 37 per cent. of fifty-six cases the obstetric chair apparently obviated the necessity of any other artificial aid.

TABLE 8.—ABNORMALITIES IN MULTIPARAS

	Spontaneous	Low Forceps	Medium Forceps	Version	Breech Extract	Total
Right occipitoposterior	11	5	5	2	..	23
Left occipitoposterior	1	..	2	1	..	4
Right occipitoposterior	5	..	2	..	..	7
Left occipitoposterior	5	..	2	3	..	10
Breech	7	..	..	..	3	10
Transverse	2	..	..	..	1	3
Left mentoposterior	1	..	..	..	..	1
Total	32	5	11	6	4	58

Of these twenty-one cases, fifteen were in the first stage of labor and six in the second. In two cases the patients were kept in the chair five and six hours, respectively, while in nine cases one hour sufficed to effect delivery, six cases needed two hours, and seven cases needed three hours for spontaneous delivery. The average duration of the entire labor in these cases was about twenty-one hours, while the average time in the chair was about two and one-half hours.

Of the twenty-nine multiparas with normal pelves, all but one was delivered spontaneously. Of the nine multiparas with abnormal pelves, Table 7 shows the important points.

In only two cases of the multiparas spontaneously delivered was the patient in the chair for more than two hours. A brief table of this series of cases, arranged with reference to the occurrence of abnormal positions and presentations and the resulting deliveries, is of decided interest (Table 8).

From this table it will be seen that in almost 50 per cent. of twenty-three cases of right occipitoposterior positions, in one case of a total of four left occipitoposterior positions, in cases of transverse and in one case of chin posterior spontaneous delivery occurred.

With regard to the case with the face presentation, the effect of the chair was to cause a rotation forward to a left mento-anterior position, and then to effect spontaneous delivery.

A brief survey of these tables, limited as is the number of cases on which they are based, cannot but bring home the distinct advantage the use of the obstetric chair offers, especially too in those cases in which, for some abnormality in the fetus or mother, operative interference seems to be indicated.

20 West Fiftieth Street.

ABSTRACT OF DISCUSSION

DR. RUDOLPH WIESER HOLMES, Chicago: Dr. Markoe's paper presages a revival of discussions on purely obstetric topics in our various medical societies, in contrast to the polemics on surgical intervention which have done inestimable harm to obstetric progress. I am sorry that Dr. Markoe did not go more fully into the question of posture in its influence as a correctional procedure, for he who has mastered the knowledge of the relation of posture to the course of labor has grasped many fundamental principles in the art of obstetrics which have a vital bearing on the simplification of difficulties due to abnormal mechanism of birth. Dr. Markoe did not picture the original obstetric chair—namely, squatting. This is the most natural posture for the emptying of the pelvic organs: in its obstetric relation, it brings the axis of the uterus more nearly into line with the axis of the pelvis, and, therefore, brings more certainly the action of the expelling forces in a line parallel to the birth canal. Crouching, or as it more comfortably may be realized by Dr. Markoe's chair, certainly theoretically and practically has an important place in obstetric therapy: however, this effect from crouching may be accomplished readily by the method of Samuel, which, in fact, secures the crouching attitude while recumbent in bed. Samuel suggests that the shoulders be raised, and as the pain begins the woman grasps her legs below the knees. In the act of straining while in this attitude she simulates the squatting posture of the aborigines. I cannot quite see how the labor is materially shortened if the average time of labor of his patients be twenty hours, and the duration in the chair be two hours. It never has been my privilege to use an obstetric chair, though constantly, in the early hours of labor, the women in my charge are encouraged to sit in a comfortable easy or rocking-chair. Such a position encourages the descent of the head through the brim. In abnormal labor, there hardly is a deviation of position or presentation of the fetal body which may not be enormously benefited by a timely application of the principles of posture in labor; in certain of these deviations of position an appropriate posture is a very definite correctional procedure.

DR. CHARLES S. BACON, Chicago: I have not been in the habit of allowing the patient to be around the room, sitting on chairs, largely because of the danger of contamination. One takes a great deal of pains to sterilize everything about the patient and to have her thoroughly clean. The danger of contamination from the floor, chairs, etc., is obvious.

I have also been somewhat in doubt on the value of abdominal contractions in the first stage of labor, feeling that it is chiefly the contraction of the uterine muscle that is of value in the dilatation of the cervix. The experience of Dr. Markoe, however, leads me to want to try the method, and I should like to ask him how the danger of contamination can be avoided.

Dr. Edward P. Davis, Philadelphia: I wish to call your attention to the value of posture in prolapse of the cord, where the knee chest position and vaginal reposition of the cord are often successful, and also to the value of the Walcher position in moderate pelvic contraction. I have often prevented cesarean section by bringing about labor by resorting to a posture on the knees. In the maternity department of the Jefferson Hospital of Philadelphia are several flights of stairs. Our matron is possessed of abundant experience and common sense, and when a woman with moderately contracted pelvis comes into the maternity ward we frequently have that woman scrub those steps. This position, with the vigorous use of the arms, results in a very large number of spontaneous labors, and we are saving a great many unnecessary cesarean sections.

Dr. E. Gustav Zinke, Cincinnati: I do not see how we are going to prevent intelligent men from performing cesarean section and other obstetric operations if they deem them necessary. The judgment of the obstetrician, after a careful study of the signs and symptoms of the case before him, is his guide. There is no question that some obstetric operations are performed too often; perhaps, without justification. At the same time we must make due allowance for errors of judgment and not condemn procedures which have proven of value. The doctrine of narrow pelvis is scarcely of age. It took 150 years for its development. Its therapy has been amply tested in the hospitals of Europe in the last fifteen years and has given very satisfactory results. The new treatment of narrow pelvis consists of the test of labor, hebosteotomy and cesarean section. The test of labor in 80 per cent. of the patients has resulted in spontaneous labors; 15 per cent. of the remaining patients were delivered by hebosteotomy, and the other 5 per cent. required cesarean section, and this with a maternal mortality of 0.1 per cent., and a fetal mortality of 4 per cent.

Permit me to call attention to just one sign or symptom which has been mentioned here, the ring of Bandl, the contraction ring. Whenever it shows itself it should always be considered a danger signal of impending rupture of the uterus. It means that the lower segment of the uterus has become exceedingly attenuated and that there is danger of rupture of that part of the organ. He who is on his guard and knows the cause of the contraction ring will not hesitate long but resort to some operative procedure and deliver his patient as soon as possible.

Dr. James W. Markoe, New York: My paper should be entitled "The Obstetric Chair" because no one could cover the subject of posture in fifteen minutes. I purposely left out the picture of the squatting posture and put in the picture of the chair because my paper was really on the obstetric chair. In regard to the question of contamination, referred to by Dr. Bacon, the woman was so placed undraped merely to show the position. Every woman in our hospital is scrubbed and cared for according to the modern method of asepsis. She has a T-binder on and an aseptic pad. Regarding the muscles, I do not advocate the woman using her abdominal muscles and I hold that she will be less likely to use them in the chair where she is comfortable and happy than in walking around the room. What I hold is that the chair gives the hydrostatic pressure to the liquor amnii to a far greater extent than do the muscles. Regarding Dr. Davis' criticism, I did not go into all the postures since I referred particularly to the chair. I feel that we ought to go more into the question of posture. I agree with Dr. Zinke regarding the ring of Bandl as one of the important signs of rupture of the uterus, although it is entirely extraneous to this subject. I have this year had four hysterectomies where the ring of Bandl had appeared just below the umbilicus. In every one of these cases pituitary extract had been used.

PREMATURE VENTRICULAR SYSTOLES

THEIR CLINICAL SIGNIFICANCE *

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CINCINNATI

In presenting a number of polygraphic and electrocardiographic tracings to illustrate the subject of this paper, I shall endeavor to bring before you certain first principles in the recognition and treatment of this form of heart irregularity. While it is desirable that, from the standpoint of the clinician, graphic tracing should be made when practicable, nevertheless, we are able to distinguish such abnormalities in the heart action by careful palpation of the pulse and auscultation of the heart sounds.

It may be safe to say that in general, premature contractions of the ventricle have given rise to too many unfavorable prognoses, and it is equally apparent that the subject of premature ventricular systoles has not been given the proper attention from the standpoint of therapy.

As a matter of fact, the point of primary importance and a point which I desire to emphasize from the very start is this, viz., that the irregularity of the heart action to which I wish to call attention has too often been attributed to disease of the heart itself, whereas the real seat of trouble is usually extrinsic to the heart. In fact, I wish most emphatically to state that in a great majority of instances premature ventricular systole—meaning a too early contraction of the lower chamber of the heart—is a functional disturbance.

Premature ventricular systoles may be of very short duration; they may last for a somewhat longer time and finally disappear altogether; or they may be more or less constant. They may be found in connection with hearts that show absolutely no other sign of disturbance, and they may be encountered in cases in which there is manifest organic disease of the heart. Even in the latter case, the premature ventricular discharge may not be the result of the organic lesion, but may again be the expression of a toxic condition in which the heart muscle becomes oversensitive.

Just as a patient with brain tumor may show signs of hysteria to complicate the clinical picture, so also may we have organic disease of the heart with certain functional disturbances, which are not essentially of cardiac origin.

THE RECOGNITION OF PREMATURE VENTRICULAR SYSTOLES

As a rule, the recognition of premature ventricular systoles is a matter of no great difficulty. In the majority of cases auscultation of the heart will prevent errors in diagnosis, since these premature contractions of the lower chamber of the heart usually give rise to a very characteristic sequence of heart sounds.

A glance at Figure 1 will demonstrate a number of factors which will serve to illustrate points in the diagnosis. The first five beats are regular in their sequence and they are the result of stimulation from the sinus node. The auricular contractions are regular, as may be seen by a glance at the chart. The *sixth* contraction of the ventricle is premature. It is in advance of the normal stimulus coming from above and, because the ventricle is in a refractory state when the sixth auricular stimulus arrives, the lower chamber is unable to

* Read before the Section on Practice of Medicine at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

respond to this command. The ventricle, therefore, rests for a longer period than usual, and does not contract or does not become active until the seventh stimulus arrives. This long pause is referred to as the compensatory pause. At the seventh stimulus the heart again contracts normally and this seventh normal beat is then seen to be followed by another premature contraction of the ventricle with the usual development of the period of compensatory rest. Here we have a diagrammatic representation of the fact that the space preceding the abnormal beat plus the space following the premature contraction is equal to the distance between two normal heart cycles.

Auscultation of the heart sounds usually shows that no heart tones have been lost, for the abnormal beat is,

Fig. 1.—Diagram to illustrate premature contractions of the ventricle.

in the majority of instances, accompanied by the first and second heart tones.

Auscultation of the heart tones also reveals the presence of the long pause after the premature beat.

Careful palpation of the radial pulse will usually reveal the presence of a small wave. At times, however, the small beat is entirely lost on the radial; indeed, the sphygmograph may even fail to show the faintest trace of a wave. It may or may not be evident in the carotid artery. As a matter of fact, some of these premature contractions of the ventricle may be so weak and so early that the semilunar valves at the aorta are not opened.

As a result we may have a change in the auscultatory phenomena. We may have the ordinary first and second sounds of the heart with the abnormal beat, or we may have only the first sound if the aortic valves are not opened by the premature contraction of the ventricle or, as happens in a few instances, even this first sound fails to materialize, or at least is not constantly audible. The latter condition must of course be very rare. The polygraphic and more particularly the electrocardiographic examination removes all doubt as to the real condition.

In some instances the premature contractions of the ventricle are grouped in such a manner as to give rise to the bigeminal pulse. In the bigeminal pulse (Fig. 2) every second beat is a premature ventricular systole. The premature beat in the radial is scarcely perceptible to the palpating finger and, indeed, it is at times not seen in the polygraphic tracing. The high peak in the jugular—the c-a peak, unusually high and sharp, shows the combination of two elements, the ventricular and auricular phases coming practically at the same time. Such a pulse is often mistaken for heart block.

I desire to present a number of tracings which show premature ventricular systoles.

A study of the electrocardiograms with the radial pulse is of great clinical interest. Figure 3 shows two premature ventricular systoles. The deflection in both instances is downward and this (apex negative) deflection is followed by a very marked deflection upward, the time corresponding to the simultaneous "P" and "T" wave. There is a long compensatory pause, as may be seen both in the electrocardiogram and the accompanying arterial tracing (radial pulse). Following the premature ventricular systoles, there is a quickening of the heart action, due to a more rapidly following sinus stimulation. The two beats following the premature ventricular systoles follow more closely and then the normal rhythm is established, until the second premature ventricular discharge takes place toward the end of the tracing.

Figure 4 shows two tracings from the same patient. In Lead I the pulse is quite regular. In Lead II there are six premature ventricular systoles, the last four occurring regularly with the third beat of the heart.

The upper tracing (Lead I) shows a series of very regular beats with the "P," "R" waves well defined. The lower tracing shows four regular beats followed by a premature ventricular systole which precedes the "P" wave by a small unit of time. In this tracing there are six premature systoles of the ventricle. After the first premature beat there is a large downward deflection at a period corresponding to the time of auricular systole. There follows a compensatory pause with a normal heart cycle. Immediately following this normal beat there is the second premature ventricular systole with, however, a small upward deflection of the "R" wave. Following the "S" deflection, which is quite pronounced, the "P" wave comes along just before the "T" wave, and there the "P" + "T" wave is exaggerated.

In this instance the patient has albuminuria, hypertrophy of the left ventricle and a somewhat enlarged aorta — Wassermann negative. Here, in looking for some extrinsic cause for the disturbance of the heart rhythm, I found a pronounced pyorrhea alveolaris. Pockets of pus were found from which large quantities of pus could be pressed. The patient was referred back to the family physician with the suggestion of immediate dental treatment.[1]

In certain instances, premature ventricular systoles may give the impression of the pulse of auricular fibrillation. It is evident that we should be on our guard because of the difference in prognosis and therapy. The tracings in Figure 5 might suggest fibrillation. The jugular curve, however, reveals premature ventricular systoles.

Figure 6 illustrates a form of premature ventricular systole which differs considerably from the usual type

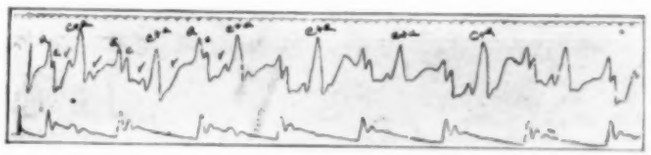

Fig. 2.—Bigeminal pulse, in which every second beat is a premature ventricular systole.

in that there is a fairly long series of premature ventricular systoles — the ventricular discharge rapidly encroaching on the preceding auricular stimulus until it precedes it by a definite interval. After eight such premature systoles the normal rhythm becomes established for a time. The upper two tracings in Figure 6 are from Lead I. In Leads II and III, we have not only premature ventricular systoles but in Lead II there are two true *extrasystoles* — the number of ventricular beats being in excess of the auricular beats. This case was one of rather mild endocarditis following a large abscess in the neck to the right of the thyroid cartilage.

1. I am informed by the family physician, June 14, 1916, that the treatment of the teeth has not only relieved the pyorrhea, but that the heart action is now absolutely regular.

Although it is usually assumed that true extrasystole occurs only when the pulse rate is rather slow, nevertheless, we have in the polygraph tracing shown in Figure 7 an instance of a rather frequent rate with true *extrasystoles* thrown in between every third and fourth beat. The diagram illustrates that we have an increase of the number of ventricular beats above the number of auricular contractions. This case is one in which there is both tonsillar infection and pelvic disease.

I do not wish to multiply the number of illustrations of the subject. There are many more interesting

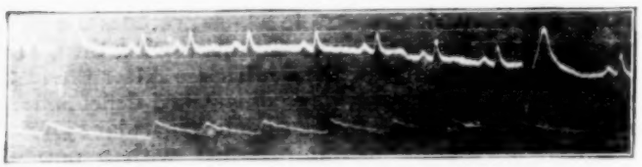

Fig. 3.—Premature contractions arising in the left ventricle.

phenomena in connection with premature ventricular systoles, but the tracings here presented are sufficient to bring out the main points.

SYMPTOMS

The occurrence of premature ventricular systoles may give rise to distinct subjective disturbances. These symptoms may be pronounced or they may occasion a mere passing discomfort. The degree of disturbance may be such as to occasion great alarm and this is particularly the case in neurotic or hypersensitive individuals. On the other hand, the grouping of the premature ventricular systole, as in the bigeminal pulse, may cause the patient comparatively little concern. There is, however, a temporary disturbance in the mechanism of the heart, and this alteration in the circulation is usually quite manifest in the violent pulsation in the neck. The patient may experience a disagreeable sense of suffocation, or, as happens in the premature beat of nodal origin, the auricle and ventricle contract at the same time, with the result that the jugular pulse becomes exaggerated. Again the beat following the compensatory pause may be, because of the greater filling of the ventricle, more pronounced

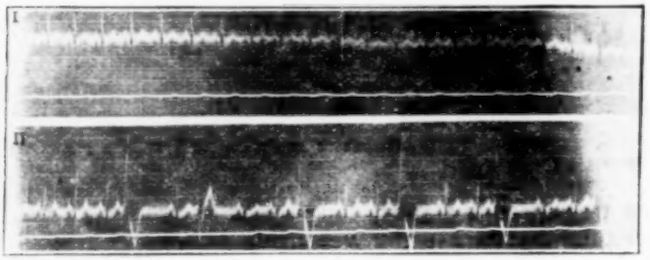

Fig. 4.—Two tracings from the same patient; upper tracing, Lead I; lower tracing, Lead II.

and give rise to a distinct throb in the neck or in the head.

I find it impossible to dilate more fully on the possible symptomatology of premature ventricular systoles. Time does not permit of a full description of the individual symptoms.

ETIOLOGIC FACTORS

The frequency of premature ventricular systoles and their association with toxic conditions are matters of extreme importance in diagnosis and treatment.

This form of irregular heart action is found in connection with toxic conditions arising in the alimentary tract; in disease of the gallbladder; in infectious conditions arising in the accessory sinuses of the nose; in suppurative processes, both acute and chronic; in diseases of the kidneys, and in conditions giving rise to high arterial tension. It is furthermore often attributed to the excessive use of tea, coffee and tobacco. Personally I have not been able to satisfy myself of the etiologic relationship of premature ventricular systoles and the use of tea, coffee and tobacco. These agents certainly have a decided influence on the circulation, and while I have frequently seen tachycardia resulting from the abuse of tea, coffeee and tobacco, and while the products so absorbed have a decided tendency to produce insomnia, I have not observed any such effects as premature ventricular systoles. While I recognize the possibility of tea, coffee and tobacco as possible agents in the production of premature ventricular systoles, we should not be too quick to assume this as a fact.

Formerly any decided irregularity of the heart action led to a diagnosis of myocarditis. However, one cannot have practiced medicine for any length of time without having been impressed with the fact that constipation is a factor of great importance and frequency in the etiology of premature ventricular systoles. It has been my experience to notice the disappearance of such heart irregularity after the admin-

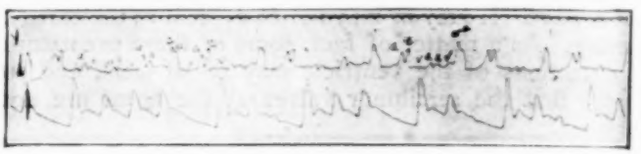

Fig. 5.—Marked irregularity due to frequent premature ventricular contractions.

istration of a good dose of castor oil. I recall here the case of a patient of 70 years with hard arteries and pronounced premature ventricular systoles and where on account of the age and arterial disease, the diagnosis of a chronic myocarditis seemed at first justifiable. Here, to my great satisfaction, the pulse became absolutely regular after a thorough cleansing of the intestinal tract. Every trace of irregularity disappeared within twelve hours after the administration of castor oil.

Acute and chronic inflammation of the gallbladder have also, in my opinion, a place in the causation of premature ventricular systoles.

I have furthermore quite frequently seen the bigeminal pulse in cases of pronounced ptosis of the stomach and bowels. However, I am not inclined to attribute the development of premature ventricular systoles merely to the ptosis of the abdominal organs. Some authorities have spoken of a reflex from the displaced organs as the responsible factor in the production of too early contraction of the ventricle. This does not seem probable. It is much more important and much more satisfactory to attribute the irregularity to the toxic condition so commonly found in connection with dilatation of the stomach and ptosis of the bowels.

At times catarrhal and suppurative processes elsewhere, as for example about the female genital organs, and the accessory sinuses of the head, have a distinct tendency to alteration in the rhythm of the heart.

Only too frequently do we find persons with premature ventricular systoles refused life insurance. In one of my colleagues, the premature ventricular systoles have disappeared after successful treatment of a marked ethmoiditis. I have noticed a distinct tendency to the development of premature ventricular systoles in cases of stones in the gallbladder.

A very large proportion of other cases exhibiting premature ventricular systoles is found in cases in which there is a distinct evidence of disease of the kidneys. Such cases may or may not be accompanied by high blood pressure. It is clear that most of them have an excessive blood pressure. This has led to the opinion that the high blood pressure is the prime factor in the causation of the heart irregularity. When we consider, however, that so many cases of chronic nephritis with high blood pressure have no such phenomena as the premature ventricular systole, we are forced to look for other causes than the high pressure alone. It is more than likely that the condition of the bowels and the toxemias of nephritis are the real factors. Free purgation and attention to the diet will have a beneficial influence on the heart.

Loss of sleep, worry and excitement, with their attendant wear and tear on the nervous system, have a

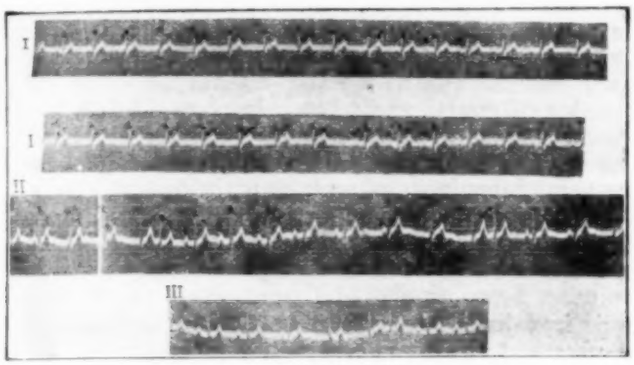

Fig. 6.—True extrasystoles.

distinct place in the etiology of premature ventricular systoles. Here again we have toxemias in the excessive use of the nervous system as the probable exciting factors, and we are therefore less and less inclined to speak of irregularities of reflex nerve action. As a matter of fact, as we develop in our knowledge of the physiology of the glands of internal secretion, the less we speak of reflex action on the heart. These cases are toxemias.

The more we study our cases of premature ventricular systoles, the more are we convinced that the vast majority of such cases, even though they have organic disease, are the subject of toxemias which temporarily disturb the rhythm of the heart. We are more and more inclined to the view that premature ventricular systoles are an expression of functional and not of organic disease. Time does not permit a discussion of all the factors or of all the varieties. Tachycardia of ventricular origin is a rare type and certainly a much more serious condition.

In view of what has been said in this short paper of the causative factors, little need be added to the subject of treatment. Look for the cause. At times it takes patience and all possible skill to find the source of the trouble, but that is our duty to the patient.

I am quite confident that this subject must appeal in a most practical way to those who are active in the great question of the risk to be accepted by life insurance companies.

I should certainly advise that persons showing premature ventricular systoles and no other sign of organic disease of the heart or kidneys be not considered bad risks. The life history of such cases should be an argument in favor of such a view.

Wenckebach in his work on heart irregularities speaks of patients with premature ventricular systoles improving under exercise, even such exertions as in mountain climbing. Such cases are no doubt a perfect demonstration that primarily the heart was not the seat
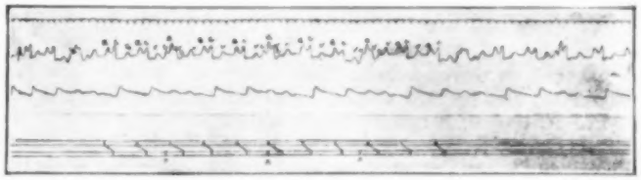
Fig. 7.—Jugular and radial pulse showing true extrasystoles. Diagram showing extrasystoles at *x*.

of trouble. Evidently the exercise in the open air restored the secretions generally.

In a certain number of cases digitalis seems to have a good influence on premature ventricular systoles, and this may be explained by the effect of the drug on the vagus. Here there is a distinct tendency to slow the rate of contractions. We may assume that up to a certain point, digitalis controls the irritability of the heart. However, in a general way the immediate use of digitalis in premature ventricular systoles should not be looked on as good practice. In other words, one should first endeavor to find the cause, and by the removal of the cause wherever possible, remove the essential factors in the production of this type of heart irregularity.

PROGNOSIS

If there is no other evidence of disturbance of the heart, let the prognosis be favorable rather than unfavorable. Base your prognosis not on the presence of premature ventricular systoles, but rather on the underlying cause.

Union Central Building, Fourth and Vine Streets.

ABSTRACT OF DISCUSSION

DR. CHARLES F. HOOVER, Cleveland: The recognition of disturbances in the mechanism has after all not carried us much further in the handling and treatment of cardiac dis-

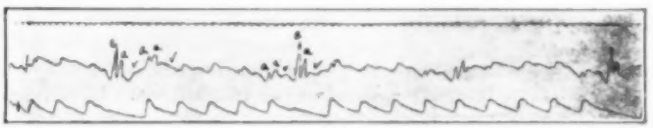

Fig. 8.—Polygraphic tracing of jugular and radial pulse; premature ventricular systoles with some arterial sclerosis and albuminuria, a type frequently found with nephritis.

ease than twenty years ago. Twenty years ago we relied on a man having certain physical exercises. In recent years we attach a great deal of importance to the recognition of disturbances in the mechanism of the heart. That does not give a clear conception of the heart's energy. We may have the same disturbances of mechanism in purely functional disorders of the heart as in organic lesions of the heart. As already pointed out, many persons have functional disorders of the heart and at the same time evidences of infection, which raises the suspicion that there is some direct relation

between infection and functional disturbances. Again there is the psychic factor; then the retrospective. I know of a patient who had premature ventricular systole after a period of several days and this was due to some disturbance in temperament. He was unable to swallow; when he swallowed his heart stopped. Instead of expectorating he would lie on his right side and allow the fluid to drool. The condition was very annoying. If he turned on his left side the heart would stop. The right side had a normal rhythm. His physical health remained about the same. The reason why these attacks ceased after five years was because he finally became convinced that he was not sick and did not have any organic disease of the heart. After all, in the recognition of disturbances in the mechanism of the heart we must rely on the fingers, which can tell us the size of the heart, enable us to tell the conformation of the heart, the size of the auricle, the relative size of the ventricle, all this being tested out with exercises. Disturbances in the heart's mechanism can be incorporated with evidences showing that we are dealing with some organic lesion.

DR. WALTER J. WILSON, JR., Detroit: While the importance of premature systoles may be exaggerated, it is not a good plan to put them all into a class of functional disorders and be satisfied with that. If functional, it is pathologic physiology. The study of the arrhythmias has resulted in the great advance in the modern management of heart disease, and the presence of any irregularity demands most careful study as to diagnosis and prognosis. A more thorough knowledge of auricular fibrillation alone has resulted in adding years to the lives of a great number of heart patients. The premature beats do often arise in acute infections. One patient with every attack of tonsillitis shows premature ventricular beats. The more severe types—and all sorts of combinations of premature beats may be observed, such as every alternate beat a premature beat—are more serious as to prognosis, one case later showing persistent pulse alteration. One patient under observation in 1914, in whom a series of premature ventricular beats of nine seconds' duration was present, was most seriously ill, as such series came frequently and resulted in attacks of syncope. Premature beats are often associated with the more severe valvular lesions such as mitral and aortic stenosis. When present in the form of premature auricular beats in mitral stenosis, they are often followed by attacks of paroxysmal tachycardia, and not infrequently are the precursors of auricular fibrillation.

As to diagnosis, the majority can be detected clinically by the stethoscope, as the ventricle, not the radial pulse, should be our guide. As to treatment, digitalis is contraindicated except in the decompensated heart, as it renders them more likely to appear from the slow ventricular rate, while hyoscyamus or belladonna by quickening the ventricular rate submerges the premature systoles. In conclusion, while the majority of cases of premature beats are not of serious prognostic omen, a respectable minority require most careful attention.

The Possibilities of Hygiene.—Certain it is that more people would practice hygiene if they could be made to realize in some vivid way how much they needed it. Few persons, even when they read and accept the statistics on the subject, really have a picture of the imperative need of hygiene as an integral part of every human life. It is not brought home to them how widespread is illness, how numerous are preventable deaths, how many are the tendencies toward individual and racial deterioration. The report of the Roosevelt Conservation Commission on National Vitality indicates that annually there are in the United States over 600,000 deaths which might be prevented if existing knowledge of hygiene were properly applied; that at least half of the 3,000,000 and more sick beds constantly kept filled in the United States are unnecessary; that the financial loss from earnings cut off by preventable disease and premature death amounts to over $1,500,000,000 annually; and that over fifteen years are lost to the average life through the lack of application of knowledge which already exists but which simply has not yet been disseminated and applied.—Fisher and Fisk, "How to Live."

PELVIC INFECTIONS IN WOMEN

COMMENTS ON SOME SPECIAL PATHOLOGY WITH APPLICATION TO TREATMENT *

THOMAS J. WATKINS, M.D.
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CHICAGO

The modern treatment of pelvic infections is based on the knowledge that has been acquired in special and general infections and immunity. The rapid advances made in the study of infections and immunity have resulted in radical changes in treatment, especially during the acute period of the disease.

Formerly infections were supposed to be local processes, and recovery was considered to be due to local changes. Since it has become known that infections, especially severe ones, are chiefly general, and that recovery is largely due to systemic immunization, important advances have been made in the treatment. The inflammatory exudate is no longer regarded as a destructive element, but as a conserving one. Recognition of the general character of infection and immunity has radically changed many of the notions relative to suppuration. Occurrence of abscesses, especially in puerperal cases, has little bearing on the severity or duration of the infection. In nonpuerperal cases the relation of suppuration to the infection is quite different, as in these cases the infective process extends along the mucous membrane, excites an increased secretion of mucus, and when it involves the fallopian tubes accumulates and generally produces abscesses. The marked difference between puerperal and nonpuerperal infections, as regards pathology and treatment, depends largely on the difference in the mode of extension of the infection. In one the infection travels along the blood and lymphatic vessels, and in the other by continuity of tissue, except for the systemic invasion of bacteria which occurs in both, but more actively in the puerperium for reasons that are obvious.

Pelvic infection involving the peritoneum is especially favorable to the development of immunity, as it excites an early and extensive inflammatory exudate which confines some of the infective discharge and takes an important part in its destruction. Pelvic exudates as a rule spontaneously become sterile. The active reaction that takes place in infection of the pelvic peritoneum is probably the chief reason why exudates in the pelvis become sterile more rapidly than in many other parts of the body.

It is impossible to determine the relative parts taken by general and by local immunizing forces. In the puerperal case, in the absence of a localized reaction, the immunity must be mostly or entirely general, and in all the acute cases of pelvic infection general immunity is probably the important curative process. In the nonpuerperal cases, the inflammatory exudate in cases of pelvic peritonitis must be a factor in immunity, as pus in these cases more readily becomes sterile than pus in many other tissues of the body.

TREATMENT

It is important to consider separately the treatment of acute and of chronic pelvic infections, as the problems encountered in the two are very different. One deals directly with the infection; the other chiefly with

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

the residues of infection. This paper will consider only parts of the treatment of acute infections.

As no specific serums or vaccines have been found for pelvic infections, diphtheria and syphilis excluded, the treatment, medical and surgical, relative to the acute period is limited to the use of remedies to aid the defensive forces of the body, that is, to sustain or increase the body resistance. Much of the treatment that has been and that continues to be used injures body resistance.

It would possibly be unnecessary and would require much time to consider in detail measures for increasing the defensive forces of the body. Fresh air treatment is among the most important of these remedies. It is much more valuable in these infections than in tuberculosis, where its value is generally known, appreciated, and effectively used, as the more acute the infection the greater must be the advantages of outdoor treatment. It is common experience to observe that the amount of sleep obtained and the amount of food taken, are often doubled after the patient is kept out doors six or eight hours daily. The importance of rest, sleep, food, elimination, and general hygiene can not be too much emphasized. They are much more valuable remedies than stimulants, tonics, alteratives and the like.

It may seem commonplace to mention the value of keeping the patient in as cheerful a mental state as possible, but it is much more important than many remedies that are highly recommended. The importance of this is appreciated by analysis of the relation of the mental state to the body functions in the well. The sick must be more susceptible to this influence than the well. Unnecessary pain, fear, and worry interfere much with rest, sleep, appetite and digestion.

Blood transfusion, which has been employed somewhat of late, must appeal to all as a remedy of great possibilities in the treatment of very acute infections, especially in those that are unable to develop a good resistance, as shown by the presence of leukopenia. Our limited experience has induced us to believe that blood transfusion is very valuable in selected cases, notably in very severe puerperal infections. In the absence of apparatus or an experienced operator, the whole blood can be easily and effectually given subcutaneously. It is highly desirable to obtain definite knowledge as to how much the increase in leukocytes and antibodies can be thus stimulated.

The recent investigations on the action of protein substances by Jobling and Petersen [1] and Miller and Lusk,[2] indicate that these remedies may prove to be of great value in increasing body resistance.

Before considering in detail the indications for some surgical measures, it seems desirable to discuss briefly the limitations of medical treatment in these cases. From an experience extending over some years and from logical deductions, we believe the treatment of nearly all puerperal cases should be entirely medical, that surgical procedures are usually more injurious than helpful. Our mortality and morbidity have been much lessened since our treatment has been less surgical and more medical. We have ceased to fear the result in puerperal infections except in the very virulent infections, usually virulent streptococcic, the type with the Hippocratic expression, the cases in which the muscles of expression are paralyzed by sepsis, the case which is hopeless when first seen. Residues in puerperal infections are uncommon, except occasional adhesions. The exudates usually disappear spontaneously by absorption. In practice it is uncommon to encounter much pelvic pathology as a remote result of puerperal infection. We will later discuss exceptional cases of puerperal infection that have surgical aspects.

The treatment of nonpuerperal infections during the acute period is also chiefly medical. In but very rare instances is surgical interference indicated in these cases. Danger to life is slight in acute nonpuerperal infection. The danger is largely one of continued morbidity and recurrent infections. The importance of delaying operative treatment in pelvic infections until the acute period is terminated is effectively proved by the results of studies and observations made by F. F. Simpson.[3]

The chief advantages of postponing surgery until the acute infection has ceased are lessened mortality, diminished postoperative pain and complications. Surgery in this class of cases is not usually as efficient in dealing with the infection as with the residues of the infection. When abdominal section is made during the acute infection, the residues from the operation may be worse than from the disease. The part taken by an inflammatory exudate in the pelvis in the production of immunity has a bearing on the indications for surgery. It is also not uncommon for patients with salpingitis to recover beyond the need for operation. Surgery has become limited in the treatment of salpingitis to cases in which residues exist which are producing distress, and to prevent recurrent attacks of infection. The following cases are presented to illustrate what the resisting forces of the body may accomplish in combating pelvic infection without the aid of surgery.

CASE 1.—Mrs. N. had been seen by me in consultation fifteen years before when she had a very acute gonorrheal pelvic peritonitis, with an inflammatory exudate that extended nearly to the umbilicus. The presence of gonococci in the urethral discharge from her husband and in her vaginal discharge established a positive diagnosis. Complete recovery resulted, except for a few friable adhesions about the ovaries, which were observed on section two years later, which was made for a large retrodisplaced uterus. She has since had four normal pregnancies and is now entirely well.

CASE 2.—Miss H. had been treated by me about ten years before for acute gonorrhea of the vagina and cervix; she later developed an acute peritonitis with large inflammatory exudates about both fallopian tubes. This apparently disappeared by absorption. She had a recurrent pelvic peritonitis, with similar pathology and result. The only pathology which remained, as observed on section some weeks later, was a few friable adhesions about the ovaries. She subsequently had a third attack of pelvic peritonitis, with extensive inflammatory exudate in both tubes. After recovery from this a second abdominal section was made and both fallopian tubes had apparently entirely recovered except for the presence of a few adhesions. These are exceptional cases, but well illustrate the possibilities of recovery of the tubes from infection.

The operative measures that are used in acute pelvic infections are chiefly curettage, incision and drainage of exudates, and excision of organs. These will be considered briefly.

Curettage of the Puerperal Uterus.—This is not in accord with the modern knowledge of infection and immunity, and has been found by experience to be a

1. Jobling, James W., and Petersen, William: The Nonspecific Factors in the Treatment of Disease, THE JOURNAL A. M. A., June 3, 1916, p. 1753.

2. Miller, Joseph L., and Lusk, Frank B.: The Treatment of Arthritis by the Intravenous Injection of Foreign Protein, THE JOURNAL A. M. A., June 3, 1916, p. 1756.

3. Simpson, F. F.: Tr. Am. Gynec. Soc., 1909 and 1915.

dangerous procedure. It is unnecessary, as the septic uterus will empty spontaneously. Its danger consists largely in causing embolic extensions from dislodgment of septic thrombi from the uterine sinuses. In the worst cases usually encountered in hospital practice and consultations the patients have been curetted and have become more ill after the curettage. Embolic infections seem to be usually secondary to and a result of curettage.

Curettement for nonpuerperal acute infections is useless, dangerous, and tends to increase the probability of extension of the disease to the fallopian tubes.

Incision and Drainage of Inflammatory Exudates.—This is a problem for judgment in some individual cases. The indications depend on the probability as to whether it will increase or lessen the resisting forces of the body. The solid inflammatory exudates encountered in puerperal cases should not be incised, as with incision secondary infections usually result, tending to interfere with and delay complete resolution. Absorption of the exudate usually takes place rapidly after an immunity has resulted. Modern ideas of infection and immunity are opposed to incision of acute pelvic exudates except in unusual instances. The presence of pus in moderate quantities may have some value in supplying spontaneous autogenous vaccinations.

In nonpuerperal cases incisions not only do not usually shorten the acute period of the disease, but often result in a persistent suppurating sinus that complicates abdominal sections which may become necessary later.

Our experience has been that we have gradually been lessening the number of patients treated by incision and drainage, until it has become the rule, even in cases with large exudates, to use medical treatment until immunity results, and then to do abdominal section if any operative work is needed.

Prolonged operations and ether anesthesia for incision and drainage of pelvic exudates should be condemned, as they are unnecessary, injure body resistance, and delay immunity.

Occasional cases of extensive suppuration are encountered in which recovery seems impossible or is extremely protracted without surgical interference. These abscesses are often due to anaerobic or secondary colon bacillus infections. Incision and drainage of these large pelvic abscesses must relieve the body of much sepsis and lessen the work of the immunizing bodies.

We believe that incision and drainage should usually be limited to patients with large, superficial, fluctuating abscesses, which can be quickly opened with the aid of local or light gas anesthesia, without much disturbance to the resisting forces of the body.

Abdominal Section for Pelvic Infection.—This is required in exceptional cases of acute pelvic infection. Suppurative and some degenerative fibroid tumors of the uterus require early operation, as in many of these cases immunity does not develop and any delay exhausts the patient. Experience has demonstrated that these cases are relatively good surgical risks.

Inflammatory exudate may produce intestinal obstruction and necessitate surgical interference. Twists of the pedicles of tumors produce conditions much like those found in the fibroids mentioned above, and require early surgery. Acute appendicitis complicating acute pelvic infections should be operated on without delay.

104 South Michigan Avenue.

ABSTRACT OF DISCUSSION

Dr. E. P. Davis, Philadelphia: Dr. Watkins said that the parturient uterus will drain itself. The uterus will do this if you give it a chance. I have in recent years seen very few cases of puerperal septic infection. Why? Because I have made it a rule in hospital and private practice that after every confinement the uterus should be made to contract and stay contracted and left in a normal position. Under this condition the puerperal uterus will drain itself. But if, after a long anesthetization, a difficult forceps extraction, a relaxed uterus is left retroverted and infected that uterus will not drain itself. Furthermore, it makes a difference what is in the septic uterus. If the membranes are within the septic uterus they are of no practical importance whatsoever; placenta tissue is of the greatest importance. Therefore, while I am no friend of the curettage of the puerperal uterus, I believe it to be the duty of every obstetrician to know as nearly as possible whether there be in the uterus placental tissue or membrane. This can be ascertained by an exceedingly gentle exploration with a large blunt curet. Very often under anesthetization of the puerperal uterus hemorrhage occurs. Drainage must not only be maintained but excessive blood loss checked by the introduction of packing of iodoform gauze. This will drain the uterus, stop hemorrhage and bring about the better reaction of the patient. I am in hearty accord with Dr. Watkins' conservative management of these cases and believe that the medical treatment of acute puerperal sepsis is certainly worthy of very careful consideration.

Dr. Thomas S. Cullen, Baltimore: I fully concur with the remarks made by Dr. Davis. In those cases of postpuerperal infection of the uterus where there has been thickening in the broad ligament I have invariably drained the broad ligament from above. A McBurney incision is made just as for an appendix operation. As soon as the peritoneum is reached it is pushed toward the median line and with two fingers I gradually open up the broad ligament as far down as necessary. Sometimes pus is encountered; more frequently just a little watery fluid, and the fingers come in contact with a hard edematous area. I introduce one or two drains into the broad ligament, and as a rule in the course of a few days, or a week or two at the most, the induration has disappeared completely. Where both broad ligaments are involved an incision is made on both sides.

Dr. Florus Fremont Lawrence, Columbus, Ohio: We must remember that pelvic infections are of tubercular, streptococcic, gonococcic and of mixed type. The work that has been done in the saving of lives by opening and promptly draining in intra-abdominal infections renders the question of medical treatment something to be considered seriously. There is no question at all that the average simple infection may self-sterilize (provided the patient lives long enough), and may recover; but if I had an infection in my abdomen, or if one of my family had such an infection, I prefer that some one get in and get busy and do it quickly. The discussion has seemingly been limited to postpartum infection. The subject of pelvic infection is much broader. The "watchful waiting," which may succeed in puerperal infections, will prove disastrous in those originating in the appendix, those of tubercular character, and particularly those due to colon bacillus infection.

Dr. E. Hoeffer McMechan, Cincinnati: A certain point made by Dr. Watkins left me under the impression that etherization under any circumstances, in association with acute infection, is always a very dangerous procedure and almost invariably involved a decrease in the protective immunity. Much work has been done in recent years in connection with ether as a therapeutic agent and this work proves to my mind almost conclusively that ether used in a proper manner not only becomes an invaluable therapeutic agent in the control of infections, but infrequently if ever does any direct harm. Gwathmey of New York found that ether-oil injection was almost a specific prophylactic against postoperative infection by the *Bacillus coli*. I think that the use of liquid ether poured into the abdomen in acute infections is a therapeutic method which will come into general use. Whether the value of the ether in this connection is due entirely to a peculiar antiseptic

property, or whether it produces a certain condition which relieves the tension of peritonitis causing the acidosis, it is difficult to determine. When we come to the toxic effects of infection we hold that for the acidosis during infection the prophylactic treatment consists in giving carbohydrates, fruit juices, alkaline waters with Fisher's solution intravenously, and in addition glucose-dextrose solutions. Etherization is used in connection with oxygenization in order to prevent increased acidosis. In order to eliminate the remnants of the anesthetic in the postoperative treatment we use the preoperative treatment of carbohydrates, alkaline waters, fruit juices, etc. We shall come to the conclusion that it is not the etherization that kills the patient but the infection. The etherization conducted as I have outlined will prove an invaluable method because some of these complications cannot be handled under local anesthesia, and in some nitrous oxid is not applicable. Ether anesthetization will satisfy all demands and I hope that the oxygenation may be continued with this method.

DR. J. H. CARSTENS, Detroit: If you have an infected uterus with placental tissue and decomposing membranes, does anybody want to say it is a good thing to let it alone? I do not think so; I would take those out. You need not scrape and leave a raw surface and open lymph channels to favor absorption, but you can just wipe it off; take pure phenol (carbolic acid), swab it out, destroying all the germs you can, cauterize the surface to prevent absorption; Nature will generally take care of any septic material in the blood. That is the right way to treat such a case. There is another type of case to which I have repeatedly called attention, a case in which there is no septic material in the uterus; the woman absolutely has no pain; there is no exudate, no swelling; the uterus is in a normal condition. You ask the patient how she is, and she says she feels fine. You find that her temperature, however, is 106 to 107 F. There is a condition I do not understand. Some peculiar micro-organism produces that high fever, some different strain of streptococcus than we know. It is not the ordinary kind. In spite of all the swabbing and cleansing you may do the disease will run its course—four, six and eight weeks—or the patient will die in the meantime. There is also another kind of case, in which pus gets into the tubes and the tubes do not close up, or in which some of the septic material drops into the peritoneum. There is a peritonitis with pus. Perhaps there is a low grade of fever and this will remain as long as the pus is being absorbed. The pus tube often drops into the culdesac. Make an opening in the posterior wall of the vagina, drain the pus out, and the patient will be well in a few days. Still another kind of case is the one in which there has been a severe labor, lacerated cervix, tubes and uterus normal, but the woman has a septic infection from the lacerated cervix. The infection spreads along the lymphatics and broad ligament outside the peritoneum and goes in the direction of least resistance, sometimes running back over the crests of the ilium, sometimes toward Poupart's ligament, sometimes in the region of the appendix. That is another kind of case—extraperitoneal, in the loose cellular tissue. The woman will suffer from sepsis. Make a good opening on the side, going through the vagina; do not get into the peritoneal cavity. Open and drain, and the patient will get well. In this kind of a case you can carry out conservative treatment; others need surgery. It is a question of what kind of a diagnostician you are.

DR. CHANNING W. BARRETT, Chicago: I agree heartily with most of the points in the conservative treatment of infection of the uterus. If some of the operative processes had not been left out which are also conservative I would have agreed with the author entirely. We agree on the point that the inflammatory process is a conservative process. The clinician said we should operate against inflammation. Later we found out that the inflammatory process was aiding the patient to get well, so we operate only for infection. Dr. Watkins pointed out that the main thing in treatment is to sustain the patient, carry out such treatment as would help the patient to put up a fight against the infection. He, however, left out the fact that we might lessen the degree of infection that the patient was to fight. There are several points along the lines of infection of the pelvis in which we can definitely lessen the amount of infection. Some say that only saprophytes infect old placental tissue. It is not true. The most deadly sort of infection can find cultural mediums in placental substance. I think we should have an empty uterus. There is a vast difference between getting the uterus empty of such material and curetting the wall of the uterus. We would do great harm by curetting the wall of the infected uterus but little harm by taking foreign material out. It may be said that we cannot take foreign material out without doing some harm, but there will be more than a corresponding amount of good come from emptying the uterus. When patients come into the Cook County Hospital with high temperature, we empty the uterus and the temperature drops. If we added curettage to the emptying, we would do harm. With infection outside the uterus we know that the lessening of pus will improve the patient's chances. Pus does not mean just sterile fluid, but fluid swarming with bacteria. If we let that out we lessen the amount of work which the forces fighting the enemy have to do. If we let that out after opening the abdominal cavity and spread infection we do harm, but if we let it out without breaking down the wall which the exudate has formed we will decrease the work which must be done. That is shown by the fact that every case rupturing through the abdominal wall is followed by the death of the patient. There is no tendency to break through the wall if we, through some point, let it out where it will do little harm. In that way we help the patient to put up a fight. We not only increase the fighting power, but decrease the work the fighting forces have to do.

DR. JOHN B. DEAVER, Philadelphia: I see many cases of pelvic infection of the postpuerperal type which Dr. Carstens has discussed. Dr. Carstens did not mention, however, the retroperitoneal infections, formerly diagnosed peritonitis, operated on in practically every instance with fatality; these are the so-called cases of concealed erysipelas, streptococcic infection by the lymphatic routes and retroperitoneal tissues. Infection from the placental site gives rise to phlebitis and to lymphadenitis. We know that the cervix is richly supplied with lymphatics, which is not the case with the body of the uterus; consequently infection of the cervix is much more common than is infection of the body of the uterus. We have two types of abortion. Practically all patients with spontaneous abortion will get well if left alone. Above all do not purge them. Almost certainly, as in appendicitis, purgation means disaster. I cannot agree with Dr. Cullen concerning the small incision. You cannot do much through a McBurney incision in septic infection. If you do anything, open up and look in.

DR. THOMAS WATKINS, Chicago: In reply to Dr. Davis I would possibly modify my statement that "the septic uterus will empty itself," to this extent, that when the sepsis is so virulent as to produce muscular paralysis—the patient is so septic that the muscles of expression are paralyzed—the uterus in a case like that will probably not empty itself. Such cases are hopeless when first seen. On the other hand, most of the very ill patients except the ones just mentioned will get well if left alone surgically and supported by intelligent medical treatment. The period of illness may be shortened by removing retained contents, but at the risk of making much worse, or of death. Appendicitis is outside the subject and was mentioned only as a complication. It has been proved that body resistance is much lessened by ether anesthetization. Dr. Carstens must know that pus almost invariably became sterile in the cases under consideration.

Prescribing Proprietaries.—Having a patient, who I thought needed the attention of a "specialist," I sent her to a city doctor. While under his care, she presented seven prescriptions at intervals furnished by this distinguished gentleman. All seven prescriptions were for "proprietary remedies." I asked a friend how he accounted for this, and whether he thought that the doctor was getting a "rake-off" or was in any way financially interested in the combines. His reply was, "He is wealthy and above reproach." How do you account then? "Downright laziness," was his laconic reply. Too indolent to write a prescription.—J. W. Crenshaw, M.D., *Kentucky Med. Jour.*, September, 1915.

INTESTINAL OBSTRUCTION *

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NEW YORK

Intestinal obstruction is no longer an abstruse laboratory study, but a many-sided problem of quite as great interest and importance to the abdominal surgeon as to the surgical physiologist.

This is a significant note, bearing on the growing value of surgical physiology to medical development in general and on the immediate importance of the new departments of comparative surgery and medicine. Again, and from another standpoint, the broadening of this subject popularizes in our profession the biologic point of view, clearing the horizon as to the origin, relationship and destiny of man. This emphasizes the geocentric as opposed to the homocentric conception of the universe in which we dwell. It helps to teach the supreme fact that far from being the central pivot of interest and importance, man, like his kindred vertebrates, is relatively unimportant; a link only in the great chain of animal and vegetable life. This has not, in the past, been the accepted doctrine and many of the medical prejudices and stumbling blocks with which we are beset have come from a failure to recognize man's place in nature.

Is it not along these abstract lines of progress that we are led by experimental study to just as important truths as are to be found in the concrete methods of laboratory work? I often think that the one is sometimes lost sight of in the search for the other and that we are apt to lose much from the broader conception of life and its variations from our arbitrary normal in a too austere and exclusive dependence on purely technical facts, particularly those relating to morphology.

I have said that today intestinal obstruction is of quite as much interest to the abdominal surgeon as to the surgical physiologist. What are these points of interest and how has the correlation of interests come about?

There is a certain well-defined clinical syndrome which has been somewhat loosely defined as autointoxication. So often is there a delay or at least an irregularity in the onward course of the intestinal contents that we are forced to concede a probable relationship between cause and effect. The moment this is granted do not our abstract laboratory studies as to the cause of death in obstruction enter into very close applied relationship with this clinical syndrome? The question as to the origin of the toxemia in dogs assumes growing importance if proved to be allied to the etiology of constipation in man. Lynch[1] has conclusively proved by careful study of the results of ileostomy upon numerous human beings that the amazing improvement noticeable in all these cases is due far more to a change in the biochemical conditions than to any mere relief of the intestine from mechanical work or to a drainage of intestine contents with bacteria and their products. These contributions by Lynch on the terminal ileum and colon have greatly enhanced the value of the winter's studies on the stomach and duodenum, and have shown that the hope for future progress in understanding the alimentary canal in health and disease lies in considering it as a whole, rather than as separated by arbitrary morphologic barriers. The researches of Barber[2] on the neuromuscular control are equally significant.

No truer words relating to the alimentary canal have been written than by the surgical physiologist Sweet,[3] who says, in concluding one of the most scholarly papers that has yet appeared on intestinal obstruction:

> We are aware that surgery already possesses a plethora of theories; but as long as a theory is given its proper valuation as a theory, as a working hypothesis, and is not accepted until supported by such an array of facts that the theory has itself become a fact, these theories offer the only means of progress in a field where so little is known.

Feeding Experiments.—For the past four years we have been interested in studying the effect on obstruction toxemia of feeding jejunal and ileal homologous epithelial cells to duodenally obstructed dogs. Two reports have been made, both suggestive that some improvement in the obstructed animals resulted. The series observed by us in the past year, however, and under like conditions fails to show any prolongation of life from the treatment. In fact the average duration of life was less than in the control animals, thus casting doubt on the further value of this working hypothesis. The result in this form of therapy is therefore still in abeyance.

TABLE 1.—DUODENALLY OBSTRUCTED DOGS, FED JEJUNAL AND ILEAC MUCOSA; 1916 SERIES

Dog Number	Average Pulse	Duration of Life, Hours
110	133	119
111	133	46.30
124	178	09.30
136	169	68.30
137	161	90.30
138	170	142
161	183	72
162	188	70
216	175	47.30
217	177	119.30
Average	1,667 166 plus	845 84½

TABLE 2.—DUODENALLY OBSTRUCTED DOGS

	1913 Series			1916, Mucosa Fed
	Mucosa Fed	Emulsion Fed	Controls	
Average pulse	156	157.4	156.3	166.7
Duration of life, hours	164.8	104.4	88.5	84.5

Duration of Life in Esophageal and Gastric Occlusion.—H. H. Janeway[4] in 1910 noted that esophageal obstruction often resulted in death without discoverable cause. Of five dogs obstructed by us transpleurally in 1916 all died of empyema within three days, thus destroying our statistics in this field.

* From the Laboratory of Surgical Research, New York University.

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Lynch and Draper: Developmental Reconstruction of the Colon Based on Surgical Physiology, Ann. Surg., 1915, lxi, 166; The Infected Colon and Its Surgery, Med. Rec., New York, 1915, lxxxvii, 983; Anastalsis and Therapy of the Colon, Am. Jour. Med. Sc., 1914, cxlviii, 828. Lynch, Draper and Lyon: Contribution to the Surgical Physiology of the Colon, Ann. Surg., 1915, lxii, 441. The foregoing articles are contained in Surgical Pathological Physiology, Volume I, New York University. Draper, J. W.: Studies in Intestinal Obstruction, The Journal A. M. A., Sept. 26, 1914, p. 1079. Lynch and Draper: The Protective or Esoteric Symptoms of the Alimentary Canal, Virginia Med. Semi-Month., 1916, xx, 601.

2. Barber, W. Howard: Dilatation of the Duodenum, Ann. Surg., 1915, lxii, 433; Surgical Pathological Physiology, Volume I, New York University.

3. Sweet: Intestinal Obstruction, Ann. Surg., lxiii, 720.

4. Personal communication to the author.

On three dogs obstructed at different levels in the stomach, the following observations were made: average duration of life, 116 hours; average pulse, 187. Clinically, these dogs differed widely from those obstructed in the duodenum. There was no spasticity of the hind legs. Vomiting was rare. All signs pointed to a less acute intoxication. Nevertheless, they died. Our previous experiments have proved that dehydration is not a factor of any more importance in this than in toxemias due to other causes, and it is hard to understand how the duodenum can stand in causative relation, being aboral to the obstruction. Still for all it may so stand. The fact that obstruction anywhere aboral to the pharynx causes death is significant. Eisberg has noted a ratio between gastro-esophageal and ileocolonic obstructions in relation to duodenal which we hope to report on later. If confirmed this ratio will support our contention that the beginning and end of the canal have many points in common and that toxicity varies inversely with the digestive power.

Effects of Introducing into the Peritoneal Cavity the Scraped Epithelium of Obstructed and Non-obstructed Dogs.—The object of this was to determine if possible what change if any had taken place in the epithelium as regards toxicity, or whether any toxicity could be ascribed to the same cells under different conditions. From cultures of the mucosa introduced in three cases only colon organisms were found. Out of a series of ten dogs eight died of peritonitis, while two showed symptoms of duodenal obstruction, namely, hemorrhage from the rectum and tremors. It is to be noted that the first is not a common symptom of duodenal obstruction, but has been observed by us to occur. It is undoubtedly due to congestion of the rectum and colon from the elimination of toxins. The results of this series are absolutely inconclusive, but an improvement in the technic might help. We incline to the belief from these studies that the toxin is not in the cell itself, but is a product of its abnormal activity.

Isolation of Intestinal Doubly Occluded Loop with Reconstruction of Alimentary Canal and Curettage of Epithelium, Having Cells within the Loop.—In four out of five cases rupture occurred on the antimesenteric border. There was great distention. In two cases the loops were black, due either to gangrene or to autolysis. The average duration of life was forty-eight hours. The peritonitis was of the most virulent type. There was much trouble with hemorrhage after the curettage. Whipple's[5] technic of removal by sodium fluorid is evidently preferable. The result of this series was negative.

Thiry-Vella Fistulas, a Single Occluded Duodenal Loop, Drained Externally; Reconstruction of Canal.—It is well known that animals so treated do not prosper. After four or five days they show marked clinical signs of toxemia and a loss of weight. They usually die soon after. If curetted, these signs do not appear. This is in accord with most other observers, but at variance with Murphy and Brody's findings.

From six dogs, 1,000 c.c. of loop fluid was collected as follows: double duodenojejunal occlusion and invagination of ends; loops about 25 cm. long. There was no difference in the rate of fluid accumulating in the loops, whether the continuity of the intestine were reconstructed or not, or whether gastro-enterostomy were done. In all three types we had loops in which no fluid accumulated. We are at a loss to explain why. We did not interfere with the venous return.

Attempts to save the animal's life by excision of the loop after the symptoms had developed and where reconstruction of canal had been done was futile except in one case. A proteose was not found in the 1,000 c.c. referred to above. Perhaps this was due to the fact that we used infusorial earth to hasten the alcoholic precipitation. According to Whipple's technic it should have stood for twelve weeks. With this exception the method used was the same as his. The effect of injecting the final precipitate into one dog intravenously was very marked prostration, temperature of 105, no vomiting, no diarrhea, no spasticity, no convulsions or tremors. There was recovery after twelve hours.

We have noted the great difficulty in saving these animals after a doubly occluded duodenojejunal loop has been left in for more than thirty-six hours or often for less time. This we have assumed to be due to an impairment of the functional power of the liver based on the studies of Schultz and the writer. They noted a diminution in the camphor-glycuronic pairing power in the liver of duodenally obstructed dogs and assumed that this might also indicate decreased power to detoxicate autogenous duodenal toxins. In such acute conditions as those under consideration there is no time for morphologic changes to show and the change in amount of liver fat is not a reliable index of the organ's protective efficiency.

TABLE 2.—NITROGEN RETENTION AND ALKALI RESERVE IN DOGS SUBJECTED TO INTESTINAL OBSTRUCTION*

Normals	Nonprotein Nitrogen, Mg. per 100 C.c.	Creatinin, Mg. per 100 C.c.	Alkali Reserve, per Cent.
No. 280	51.3	0.1	28
281	44.4	0.1	50
282	45.3	0.1	48
308	29.0	0.55	45
307	29.0	0.8	38
(Tumor of Spleen) (Encapsulated hematoma)			
Doubly obstructed duodenojejunal excluded loop:			
Twenty-four hours after operation:			
No. 281	52.3	...	52
298	57.3	0.1	42
299	41.4	0.1	61
Forty-eight hours after operation:			
No. 298	68.1	0.2	60
299	82.8	0.75	48
304	85.0	1.00	57
305	101.0	2.00	...

* As far as we have gone three things are noticeable: First, a rise in nonprotein nitrogen; second, a rise in creatinin; third, it seems to grow more alkaline. These changes seem most noticeable after forty-eight hours.

Frazier and Peet[6] have introduced a most ingenious method to study this point, namely, an Eck fistula. It is more accurate and less cumbersome than Tollen's glycuronic technic.

Whipple in a comprehensive study of the subject has isolated a proteose from such doubly occluded loops. This he considers to be the direct toxin from the mucosa and in this supports Roger, who some years since showed the presence of proteose.

Sweet, while agreeing that the toxin undoubtedly originates in the cells of the duodenum, points out that an acceptance of the proteose hypothesis of Roger and Whipple entails a modification of our present under-

5. Whipple and Stone: Intestinal Obstruction: Study of a Toxic Substance, Jour. Exper. Med., 1913, xvii, 286.

6. Frazier and Peet: Ann. Surg., June, 1916.

standing of protein digestion and gives strong proof of the toxic activity of the pancreas in intestinal obstruction. He points out the clinical resemblance between acute pancreatitis and duodenal obstruction.

CONCLUSIONS

The cause of death in intestinal obstruction is still unknown, but all recent studies point to aberrant activity of the duodenal and probably pancreatic cells. The old hypothesis that the toxin is of bacterial or food decomposition origin may be looked on as discarded. Dehydration is of no greater importance in this than in other toxemias.

There is an important ratio between the toxicity of the intestinal epithelium and its digestive power.

The intricate syndrome autotoxemia occurring in man will be better understood when we know the cause of death in duodenally obstructed dogs.

I am indebted to Dr. Gettler of the department of chemistry, New York University, for Table 3, which appears to show some interesting and constant changes in the blood of duodenally obstructed animals.

ABSTRACT OF DISCUSSION

Dr. H. D. Johnson, New York: When the intestine is obstructed, death results from either water starvation, food starvation, or both, or from toxic absorption. In my clinical work I have tried to differentiate these classes of cases and to treat them accordingly. I have thought out some death lines. I had a case of obstruction in the stomach at the pyloric end. There was regurgitation of water and no toxic symptoms whatever so far as I could see. I have not seen the high obstruction of which Dr. Draper speaks. The nearest approach to it was in a case in which there was obstruction at about 4 feet down the jejunum, in which the symptoms were those of acute toxemia as well as water starvation. It is well to remember that these patients not only do not take water, but the water which they have is not utilized. The toxic symptoms are less acute as you get away from the pylorus and into the region of the large intestine, where the toxic death line is very long delayed. The point I would bring out is to provide drainage. If you will make an end to side anastomosis and put in a rubber tube in these cases needing daily drainage you will produce a water-tight bowel anastomosis. If you have not the proper tube, cut off a glove finger and make a water-tight joint between the glove finger and the intestine through which you may irrigate the bowel and through which gas may escape. In one case of high obstruction I kept the patient alive for an indefinite period, feeding by rectum and through the anastomosis. The tube should be dropped straight into the bowel so that there will be no angulation. If normal action of the bowel is restored, either by nature, or surgery, that fistula will not stay open.

Dr. C. Hugh McKenna, Chicago: About seven years ago, when Dr. Draper first brought out his work on acute intestinal obstruction, Dr. Bloodgood of Baltimore directed my attention to this work because I was somewhat interested in the clinical phase of the subject. Having had one or two interesting cases in which I had performed enterostomy, I started some experimental work along the line suggested by Dr. Draper, and since that time we have operated successfully in eight human cases of acute obstruction by performing a jejunostomy, preferably in the upper part of the jejunum. These patients are operated on under local anesthesia. The jejunum can be picked up without unnecessary manipulation of the gut, which is important, and an enterostomy is performed by attaching the intestine to the skin alone by Lembert sutures, making it for the time being hermetically sealed so that none of the secretions can run back into the peritoneal cavity. It has been interesting to note that at the time of the resection of the bowel or closure of the fistula five or six weeks later, a small tip of gut was pulled off at right angles to the jejunum, so that for two weeks preceding the operation for closure practically the entire intestinal content continued down with very little passing out on the abdomen. The welfare of the patient seems to be in proportion to the position of the opening in the small intestine, whether high up or low down, and the presence and amount of pancreatic secretion which is poured out on the skin of the abdomen is indicative of a high enterostomy. Every abdominal surgeon will know this to be true. In other words, the question of getting an enterostomy high up in the small intestine is the all-important part of the operation, just as has been proved by Dr. Draper and other men doing this work. In our experimental work the frequency of death was in proportion to the position at which the obstruction was caused. From the work of Whipple and others, I am inclined to believe that the fatal factor in ileus is due to a normal physiologic intra-enteric secretion that comes probably from the duodenum and which, when the peristalsis of the intestine is interfered with sufficiently to block up this secretion, gives us one of the most powerful toxins, which condition if not corrected produces death. To those who claim that we may gain results by placing a tube down through the stomach and into the duodenum for lavage, I wish to say that my clinical experience has taught me that there must be a permanent drainage until the normal tone of the duodenum and upper intestinal tract has been entirely restored.

Dr. John William Draper, New York: It is very encouraging to those who spend a great deal of time in abstract studies to feel that the results will be of use in applied surgery. Dr. Johnson referred to water starvation. It was with the hypothesis of water deprivation in relation to this toxemia that we performed the following experiments. We took a series of dogs and gave them pilocarpin in very large doses. We then suddenly obstructed a similar number. The former lived; the latter died. All tissues were then excised. I cannot give the exact figures, but there was less than half the amount of water in the tissues of the pilocarpinized animals than in the animals dead with intestinal obstruction. Although twice as dry, the pilocarpinized animals were clinically normal and healthy in every respect. It is well known that with an increased water content, with dilution of the toxemia, any toxic animal will live longer. Dr. McKenna spoke of the desirability of draining away the material which has accumulated above the obstruction. This is a subject in which I am much interested, but of which we know little. I am, however, quite familiar with his work. Statistics collected at the Johns Hopkins by McGlannan would seem to indicate that better results were obtained from such drainage, but it is about "fifty-fifty." It is quite conceivable that this material which everybody knows is very toxic may be of great value as a detoxinating agent for the host itself, although toxic to other individuals.

The Quantity of Light.—The quantity and intensity of light may be considered in relation to the special place of work and to the surface on which the work is performed. The quantity of light will depend on the source and the kind of light which is let into the factory, and the adequacy of light will also depend on the kind of material on which the work is performed. Mr. Wilson, who has made the light investigations for the factory department of England, distinguishes two kinds of work, which he names respectively inspective and detective, according as the work entails continuous application of the eye to one point or small area, or consists merely in keeping general watch over a given process, actual labor being demanded only when some fault occurs. "The making up of clothing, handkerchiefs and typesetting," he says, "belong to the inspective class; while cotton and flax spinning and preparing belong to the detective class." The work of a watchmaker, jeweler, or draughtsman requires very much more light than the work of clothing or any needle workers. The work of a hand typesetter, for instance, may also be divided into several kinds. It requires more light to decipher some of the manuscripts which the typesetters have to set up, and certainly much more light than that which is necessary on the typestick itself. Proofreading may require more light than any of those mentioned.—George M. Price, *The Modern Factory*.

THE FRACTIONAL EXAMINATION OF THE STOMACH CONTENTS *

ELBRIDGE J. BEST, B.S., M.D.

SAN FRANCISCO

Today the accepted method of obtaining the contents of the stomach is by means of the stomach tube, a rubber tube usually of 34 F. caliber and 80 cm. long, with bulb and funnel attached. It is a rather unpleasant event to the patient to have the tube in the throat, and, because of the unpleasantness, it cannot remain there any length of time. It is almost ideal for removing the contents of the stomach and for lavage. Also, because of its size and thickness, it can be used when the patient is decidedly unwilling. For diagnostic purposes this large tube has its limitations. After test meals it is used once, the accepted procedure being the removal of the stomach contents forty-five minutes after ingestion. By measuring the volume of the obtained contents we assume we know the amount of meal and secretion still remaining in the stomach. By titration we learn the concentration of acid present. There are well founded objections to this method. In the first place we may not obtain all of the stomach contents and, second, our chemical findings represent only one phase of the digestion. Consequently we dare not make definite statements, from this one phase, regarding the behavior of the stomach.

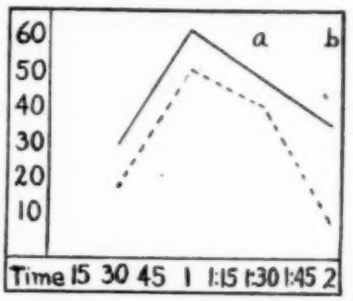

Chart 1.—Normal curve. Digestion complete in two hours. O. P. D. 17312. *A*, phenolsulphonephthalein +; *b*, secretion scanty, phenolsulphonephthalein absent. In the charts the solid line indicates the total and the broken line, free hydrochloric acid.

Because of the objections raised regarding this unsatisfactory method of learning what the stomach is doing, many variations have been adopted from time to time to offset them. Some diagnosticians withhold opinion until several examinations have been made. One method is to remove the contents at varying periods following the test meal, on successive days. This procedure is less objectionable when the patient is in a hospital; but to have an ambulatory case return day after day is far from ideal.

Our object is to obtain all possible information, and, at the same time, cause the least amount of discomfort, loss of time and secondary injury to the patient. The regular stomach tube does not answer these requirements.

Recent work on the physiology of the stomach has given us more light on the normal, and better understanding of the pathologic. We have been taught, from clinical findings, that hydrochloric acid is found in a normal stomach at about 0.2 per cent. concentration, and that anything above this is to be considered as hyperchlorhydria. Yet the careful work of Boldyreff[1] shows the true secretion from the stomach glands to be quite constant at 0.5 per cent. hydrochloric acid concentration. Why we do not find this high acidity normally, Boldyreff explains through a reflux of duodenal contents whose alkalinity quickly reduces the excess of acid. Cannon[2] has shown the presence of a reflex at the pylorus which allows the pylorus to open and close, depending on the presence of free hydrochloric acid on the gastric or duodenal side. Then there can be a nerve control over the stomach secretion governed by an optimum acid concentration point, as suggested by Mintz.[3] This point can vary with the individual. A quantity of food is introduced into the stomach. The gastric glands have been previously stimulated through the taste (Pawlow,[4] Carlson[5]). The food dilutes the secretion, while the contained protein combines with the acid. These two factors diminish the concentration of free hydrochloric acid. As long as stimulation is present, the secretion of gastric juice continues. The protein present increases the rate of secretion (McClendon[6]). Furthermore, the faster the secretion is produced, the higher is the concentration (Carlson[7]). Should the concentration exceed the high point for the particular stomach, a reflux of duodenal contents takes place to lower the acidity. When no food is in the stomach the stimulation is lacking, and secretion ceases or is very small in amount. Through a relaxed pylorus, duodenal contents may enter and keep the original high acid secretion down to the figures found in the contents of the resting stomach (Boas, 1889-1890, Boldyreff[8]).

The nerve control may be deranged and cause various pathologic findings. Inhibitory influences may be lacking and the secretion may continue after all food has left the stomach, or a derangement may take place which causes a failure in the response to the higher acid concentration, and the acidity approaches that of the pure juice. This high concentration may be reached early in the digestion, for instance, near the end of the first hour, and continue. Or the highest point may not be reached for hours after the meal has been ingested.

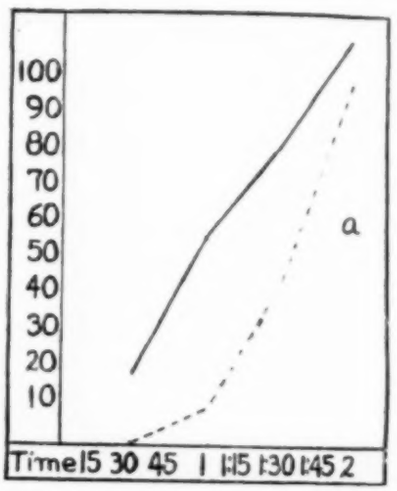

Chart 2.—Continuous secretion. Duodenal ulcer. O. P. D. 18135. Free hydrochloric acid absent in thirty minutes. *A*, phenolsulphonephthalein +.

The evidence obtained by physiologic workers, as Boldyreff,[1] and clinical observers, as Carlson,[5] shows the pure secretion from the gastric glands to contain 0.5 per cent. hydrochloric acid. On entrance into the stomach of 400 c.c. of water and masticated bread, as represented in an Ewald meal, it is readily seen how low the acid concentration will be at the beginning of digestion, through simple dilution. As digestion continues, we have two factors which tend to increase the acidity; first, the highly acid secretion from the gastric glands, and, second, the loss of certain amounts of stomach contents by passage of the chyme, at intervals, into the

* From the University of California Medical Clinic.

1. Boldyreff: Quart. Jour. Exper. Physiol., 1914, viii, 1.
2. Cannon: Am. Jour. Physiol., 1907, xx, 283.
3. Mintz: Russk. Vrach., 1915, xiv, No. 14.
4. Pawlow: The Work of the Digestive Gland, London, 1910.
5. Carlson: Am. Jour. Physiol., 1915, xxxvi, 50.
6. McClendon: Am. Jour. Phys., 1915, xxxviii, 191.
7. Carlson: Am. Jour. Physiol., 1915, xxxviii, 248.
8. Boldyreff: Ergebn. d. Physiol., 1911, xi, 121.

intestine. Toward the end of digestion the acidity should decrease, owing to a diminishing activity of the gastric glands and reflux of alkaline duodenal contents.

The gastric contents then should show an ever changing picture of acidity, rising from very low concentration to an apex which should be constant for each individual stomach, and probably regulated by a complicated reflex mechanism, finally descending to a low acidity at the completion of digestion. Such being the case, what information is obtained of the patient's condition, if we know that at forty-five minutes after an Ewald meal the free hydrochloric acid is at 40? To know our patient we should have a graphic picture of the stomach activity during the digestion period. This can be obtained by plotting the concentration of acid at certain definite periods of time.

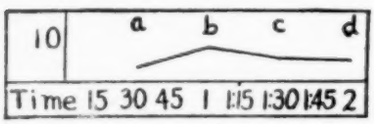

Chart 3.—Achylia; phenolsulphonephthalein showing rapid motility. O. P. D. 13518. Free hydrochloric acid absent. *A*, mucus + + +; *b*, phenolsulphonephthalein +, mucus + + +; *c*, phenolsulphonephthalein absent, mucus +; *d*, mucus +.

It becomes necessary to obtain and examine samples of the stomach contents at regular short intervals during the process of digestion. Rehfuss[9] has called our attention to the use of the duodenal tube for this purpose. He modified the tube somewhat, making a heavy metal tip with large openings to lessen the clogging of the openings with food. The rubber tube is No. 8 F., easily swallowed and retained, with practically no discomfort, over a period of hours. Samples of the stomach contents can be removed every five, ten or fifteen minutes, and the chemical tests made and charted. On coordinate paper, curves can be plotted which show graphically the ever changing picture of the stomach content. This method opens up a wealth of possibilities. We can study the variations in acidity in the normal stomach from beginning to end of digestion, note the entrance of duodenal contents, and follow the secretory activity of the abnormal stomach.

In 1912, Ehrenreich[10] published an article on the examination of the stomach activity over a period of hours by means of a stomach tube remaining in position during that time. He had previously used successive days, introducing the ordinary tube ten, twenty and thirty minutes later each day. This had also been done by Ewald and Boas in 1885, Reichman in 1885, Rosenheim in 1888, Jackson in 1890, and Schule in 1895. The results were unsatisfactory in that they gave no real essential knowledge. From Ehrmann,[11] Ehrenreich received the idea of using a long thin Nealton catheter, which Ehrmann used for duodenal feeding. Later Ehrenreich discovered that Gross,[12] in 1893, had used a similar small tube in duodenal work and recommended it for diagnostic use in stomach examinations, but did not use it for that purpose.

Ehrenreich gave the Ewald meal because of its extensive use, then introduced the small tube which remained during the test and, by means of a Politzer balloon and glass connecting tube, aspirated small quantities of the stomach contents at definite intervals. He tested the acids and ferments of trypsin and pepsin. Curves were plotted showing the increase and decrease of the acid concentration. The apex of his curves was not always at sixty minutes. In healthy stomachs this was frequently true, but with pathologic stomachs the high point was not reached sometimes until the two hour or three hour period. These facts could not be discovered with the older method, and he strongly recommended the adoption of this technic in stomach clinics. He found trypsin present regularly entering the stomach during digestion, and with the increase of trypsin a decrease of hydrochloric acid. Mucus also played a part in lowering the acid content. The presence of trypsin shows the duodenal contents to be normally regurgitated back into the stomach, and plays a definite part in the acid concentration.

Skaller,[13] after reviewing the various methods of stomach examination and their limitations, described a method of using a duodenal tube 2 mm. in diameter, with a metal tip, which he left in the stomach a distance of 50 cm. from the teeth. He removed a few cubic centimeters of stomach contents every five minutes, and tested the acid concentration. He plotted curves of acidity over a period of sixty minutes.

Skaller's qualifications for a test meal are: (1) a homogeneous mass, liquid; (2) light, as is the Ewald meal, and (3) stimulating to the gastric secretion. The one article that answers these requirements is Liebig's meat extract in water. He gave 200 c.c. of water and 5 gm. of meat extract. The amount remaining in the stomach at the end of the hour is removed and measured. Skaller does not consider this breakfast a substitute for the Ewald test meal, but finds it an admirable substitute for studying the secretory power of the stomach. His findings show the fallacy of a single stomach test. His results parallel Pawlow's findings with the blind pouch. He does not mention Ehrenreich's work.

In July, 1914, Skaller[14] demonstrated the use of his small tube before the Berlin Medical Society. He mentions the work of Ehrenreich, but considers the Ewald meal and milk as a test meal not ideal. Skaller used a small tube with a heavy metal tip, made of tantalum and heavy enough to reach and stay at the bottom of the stomach. He again emphasizes the meat extract as ideal, answering all requirements. By being colored, this meal can be used to determine when the stomach is empty, by the absence of the meal if the color is properly checked up. He recommends using 25 drops of phenolphthalein solution to determine the motility. Other advantages of the tube are the determining the presence of mucus and quantitative estimates of the stomach ferments. Skaller does not discredit the old method of examination, but considers the fractional method a decided refinement and within the range of the busy practitioner.

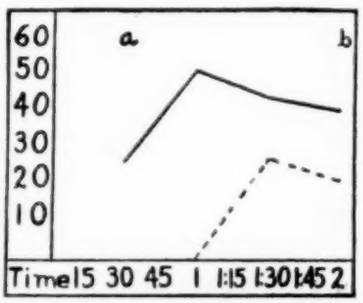

Chart 4.—Late appearance of hydrochloric acid, with total acid curve of normal shape. O. P. D. 20085. Suspected gastric malignancy. *A*, mucus + + +; *b*, phenolsulphonephthalein +.

Regarding the use of the small tube for the stomach examination, we have the following information: Gross,[12] in 1893, mentioned the possible use of a small

9. Rehfuss: Am. Jour. Med. Sc., June, 1914.
10. Ehrenreich: Ztschr. f. klin. Med., 1912, lxxv, 231.
11. Ehrmann: Berl. klin. Wchnschr., 1911, No. 49, 2226.
12. Gross: New York Med. Jour., Nov. 18, 1893.
13. Skaller: Berl. klin. Wchnschr., Nov. 24, 1913.
14. Skaller: Berl. klin. Wchnschr., Feb. 1, 1915, p. 105.

tube for stomach investigation. Then Ehrenreich,[10] in 1912, received the idea from Ehrmann,[11] and put to a practical test a Nealton catheter. Skaller,[13] in 1913, used a very small duodenal tube of 2 mm. diameter with a metal tip. Rehfuss,[9] in June, 1914, described his tube, the idea of which was suggested by Palefski. Palefski used a soft rubber tube for duodenal work of No. 8 F. caliber, with a heavy metal tip weighing 105 grains and containing numerous perforations. Rehfuss altered the tip by making slots of equal diameter to the rubber tube, which was No. 8 F. His tip weighed from 90 to 120 grains. At about the same time Skaller,[14] in July, 1914, in an address, describes his tube, very similar to the Rehfuss tube. He emphasizes the weight of the tip as very important for remaining at the bottom of the stomach. Apparently his tip was perforated with small holes. Other workers with the small tube and fractional examination of the stomach are Bondi,[15] Sybrandy,[16] Lanza,[17] and Egan.[18] Egan used the small tube and fractional examination in conjunction with a barium meal and the Roentgen ray.

Various test meals have been used in determining the gastric function, such as the Ewald meal of two slices of bread and two glasses of water; 200 c.c. of milk; the whites of two or three eggs; beef extract, 5 c.c., in 200 c.c. of water, and a dry test meal. These are all simple meals, easy to obtain, have an abundance of fluid, and save the dry meal, all of which are qualifications for a satisfactory test meal. Ehrenreich[10] used various test meals and found striking differences in his results. For instance, with the egg white meal he found the hydrochloric acid curve greatly changed and diminished and, in some cases, absent. With the milk meal, his curves became extremely high, especially the total acid, showing an increased acid content. Van Spanje[19] advocates a dry test meal in order to determine the actual secretion. He gives a triscuit with no fluid; then what fluid is recovered is the pure gastric product. Skaller[20] uses Liebig's beef extract and considers it ideal, as it answers all the requirements of an Ewald meal, contains nothing to clog the tube, and is a marked stimulant to the appetite through its tastiness. Mintz[21] has also worked with meat extract meals. Rosenheim[22] finds beef extract very reliable, but prefers the Ewald meal for all practical purposes.

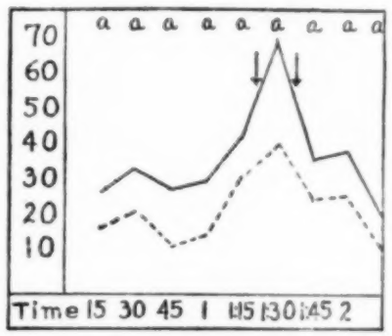

Chart 5.—Mr. G. Pain one and one-half hours after eating. Gastro-enterostomy two years previous for gastric ulcer. Bile present throughout; *a*, bile +. Arrows indicate burning pain.

We know that the extractives of meat are not foods. It is true they stimulate pleasant sensations, but they are otherwise toxins to be eliminated as quickly as possible. Their use in stomach work will call forth an appetite secretion, but does this give us a true picture of normal digestion? The Ewald meal is perfectly satisfactory in every way save in the possibility of particles stopping the tube and in its low protein content. When the patient follows instructions and chews each mouthful well, the trouble with clogging is fairly eliminated. This is especially true when the tip with large slit openings is used. The universal use of the same test meal is necessary if we would accomplish uniform results. Results are worthless for interpretation unless all factors are the same. Years of experience have shown the value of the Ewald meal with the large tube. Consequently it is to be strongly recommended as the test meal in making the fractional examination.

To determine gastric motility, certain additions have been made to the test meal by various workers at various times. Boas and Kemmerling[23] used chlorophyl. The yellow color of the meat extract has been used.[14] Skaller found that chlorophyl disturbed the acid determination. He used phenolphthalein, adding 25 drops to the water or meat extract and testing the samples for the presence of phthalein by adding strong alkali. The phthalein is quite harmless and does not interfere with any other color reaction. When the test meal has entirely left the stomach, the phthalein will have left also. This gives us a definite reaction for determining the emptying power of the stomach.

The first part of our work on fractional examination of the stomach function was done with a small duodenal tube, of the Einhorn type, which had a perforated metal tip. Occasionally difficulty was encountered in obtaining samples of the stomach content through plugging of the perforations in the metal tip. This was especially true when thick, ropy mucus was present. In due time a Rehfuss tube was received and the samples were obtained with greater ease, because of the wide slits in the metal tip in place of the small perforations. Yet even with the wide openings, plugging will occur in rare cases.

In order to obtain a fairly accurate picture of the chemical and physical activity of the stomach, over a definite digestion period, with a minimum loss of time and inconvenience to both patient and physician, we have found the following procedure to be very serviceable: On an empty stomach, the patient is given a test breakfast consisting of two pieces of bread, with no crust, and two glasses of water to which 25 drops of phenolphthalein (1 per cent.) have been added. The patient chews the bread fine and takes the water along with the bread. Before thirty minutes have elapsed the tube is passed. This is done by having the patient open his mouth and say "ah." The metal tip is dropped behind the tongue, and the patient swallows. To prevent gagging and retching, the patient takes deep breaths. When this is done the tube can be passed to the 50 cm. mark, with hardly an unpleasant sensation to the patient. When down, the tube is kept to one side of the throat and causes very little annoyance. During this period the patient can talk, read or devote his attention toward any minor employment, to pass the time. Saliva is frequently abundant. The patient is instructed to spit this out, not to swallow it. Ehrenreich[10] found that patients would have from 50 to 100 c.c. of saliva.

Samples of the stomach contents are removed in a half hour, one hour, one and one-half and two hours

15. Bondi: Arch. f. Verdauungskr., 1913, xix, 692.
16. Sybrandy: Nederl. Tijdschr. v. Geneesk., 1915, lx, No. 18.
17. Lanza: Riforma med., Naples, 1915, xxxi, No. 20.
18. Egan: Arch. f. Verdauungskr., 1915, xxi, 479.
19. Van Spanje: Nederl. Tijdschr. v. Geneesk., 1913, lviii, No. 4.
20. Skaller (Footnotes 13 and 14).
21. Mintz: Deutsch. Arch. f. klin. Med., 1912, civ, Nos. 5 and 6.
22. Rosenheim: Med. Klin., 1915, xi, No. 35.
23. Boas: Deutsch. med. Wchnschr., 1912, xxxviii, No. 10. Kemmerling: Arch. f. Verdauungskr., 1914, xx, 49.

after starting the breakfast. A "Triumph" syringe is used to exert suction; about 3 to 5 c.c. of contents are withdrawn; then several cubic centimeters of air are blown back by the syringe through the tube to prevent an error from unequal mixing of different samples. The syringe is cleaned each time after a sample has been obtained. The tube is easily removed. When the metal tip reaches the pharynx, some resistance is met. The patient is instructed to swallow, and moderate traction is exerted to cause the tip to slip into the mouth. Of each sample, 1 c.c., unfiltered, is titrated with hundredth normal sodium hydroxid, the Topfer method for determining hydrochloric acid and total acidity being used. The results are charted on coordinate paper, and lines connecting the points give us a graphic picture of the stomach contents during digestion. By adding alkali to the two hour sample the presence or absence of phenolphthalein is shown, which gives us information regarding the motor power of the stomach. The presence of phenolphthalein indicates the presence of the original meal still in the stomach. It has been shown by Seidel[24] that unfiltered stomach contents give more accurate acid results, unless mucus is present. In the latter case, the stomach contents should be filtered.

We have, then, a procedure which gives us information on the digestive cycle, very simple in execution. It is a method which can be handled perfectly by a nurse and not too exacting in its demands on the patient. It is an examination to be used not only in specially selected cases, but also as a routine in all gastric complaints. It can be used by the general practitioner as easily as in the teaching hospitals.

Further reports will be necessary from many careful workers, for the more accurate interpretation of the graphic curves. A great many cases must be examined, and the latter findings at operation, necropsy, etc., must be added to prove the real value of our results. If one looks over a large number of curves, certain features stand out prominently. The healthy stomach usually gives a curve that rises to its apex in one hour and descends to a low point in two hours (Chart 1). The hydrochloric acid curve is symmetrical with the total acid and usually within 20 of the total concentration. A continuous secretion curve (Chart 2) rises steadily to two hours and, if followed longer is found to stay high, making a plateau over a long period. In pure achylia, the constant absence of free hydrochloric acid is found, while the total acid curve holds a fairly level course (Chart 3). Other cases are found that have no free hydrochloric acid at certain periods, yet free acid is present at others (Chart 4). In view of the fact that many statements have been made regarding the pain in gastric ulcer being due to high concentration of acid, it is interesting to note that in a case of gastric ulcer two years following a gastro-enterostomy, pain was felt one and one half hours after eating, readily relieved by alkalies. The curve of acidity (Chart 5) shows not only no hyperacidity but barely the normal concentration. The late apex was reached at the time of pain, and relief was experienced with the fall of acidity.

It is hoped this summary of later work on stomach examination will help to bring this very satisfactory fractional method of investigation more strongly to the attention of physicians, that it may be adopted universally, resulting in more accurate diagnosis.

240 Stockton Street.

24. Seidel: Arch. f. Verdauungskr., 1915, xxi, No. 3.

TRICHINOSIS

IMMEDIATE RESULT FOLLOWING INTRAVENOUS INJECTION OF NEOSALVARSAN

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AND
WILLIAM B. McNERTHNEY, M.D.
TACOMA, WASH.

In the past it has been doubtful whether any direct measures have had beneficial influence in arresting the trichinae, after the muscles have once been invaded. It has been simply a Verdun conflict of the mastery between the strength of the patient and the life of the trichinae, securely entrenched in nearly every tissue, even to spinal fluid, as was first demonstrated by Van Cott and Lintz,[1] and later confirmed by Bloch[2] and Elliott.[3]

H. R., German, aged 33, entered St. Joseph's Hospital, July 30, 1915. While watchman for a cold storage plant, he had eaten for some days undercooked ham. Before entering St. Joseph's Hospital, he had been in another institution in a different part of the state, since the date of his infection. The nature of the treatment we were unable to ascertain. He was rapidly getting worse and was brought to the hospital on a stretcher.

The patient, in his fifteenth week of disease, was greatly emaciated and severely prostrated, having lost 60 pounds. The temperature was 100. The forearms were flexed on the arms, and there was restriction of the wrist joints so marked that he was unable to lift a cup or feed himself. There was rigidity of the muscles of the neck, and deglutition was difficult. The chest muscles appeared free. The abdomen was tender to touch, with rigidity of the rectus muscle. The Kernig sign was present. The patellar reflex was absent. The hip joints were extremely painful and the lower limbs showed a cyanosis and edema. Owing to the long confinement, the patient had sores. It was apparent that he was suffering from a severe type of anemia, and a blood examination at this time showed: Erythrocytes, 3,000,000; hemoglobin, 55 per cent.; leukocytes, 30,000; differential count: neutrophils, 58 per cent.; lymphocytes, small and large, 7 per cent.; eosinophils, 35 per cent.

A section of muscle fibers was removed from the lower third of a biceps muscle, and numerous living trichinae showed in every field. The cerebrospinal fluid or blood was not examined for trichinae.

Fortunately for our patient, we were unaware of the use and results of neosalvarsan in trichinosis, as reported by Van Cott and Lintz. Independently we realized our utter helplessness with the usual therapy, and decided to use intravenously 0.06 gm. of neosalvarsan. During its administration he became slightly cyanosed and it was followed by a marked chill. Within forty-eight hours, the patient felt less pain than he had for months, and was soon able partially to extend his forearms. Within one week he was in a chair and able to sit in an automobile, and left the hospital, Aug. 9, 1915. Fourteen days after intravenous injection he was able to walk with crutches, and three weeks later he discarded his crutches and went on to an uninterrupted recovery.

The scientific paper and work of Van Cott and Lintz and their unfavorable results in the use of salvarsan and neosalvarsan would make us slow to use neosalvarsan. However, in our case, we were rewarded with a most favorable result, which seems to prove beyond a doubt that in certain stages of the disease, at least, neosalvarsan intravenously is a rational method of treatment in trichinosis.

1. Van Cott, J. M., and Lintz, William: Trichinosis, THE JOURNAL A. M. A., Feb. 28, 1914, p. 680.
2. Bloch, Leon: Trichinosis, THE JOURNAL A. M. A., Dec. 18, 1915, p. 2140.
3. Elliott, A. R.: Trichinosis, THE JOURNAL A. M. A., Feb. 12, 1916, p. 504.

BLOOD CULTURES IN EPILEPSY *

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AND
WADE W. OLIVER, M.D.
CINCINNATI

In cultures from the blood of the following six cases of epilepsy we have failed to isolate the organism described by C. A. L. Reed[1] as the *Bacillus epilepticus*.

Dr. Reed gave us one of the cultures isolated by Dr. Hyatt from a case (S). As far as we could tell, this organism belonged to the *B. subtilis* group. Its morphology is well shown in the photomicrographs published by Dr. Reed in the article cited. It varied in its reaction to Gram's stain according to the medium on which it was cultivated. In size it resembled *B. subtilis* and formed terminal and subterminal spores which, when mature, were almost central. It grew rapidly at 37 C. or 24 C. with a smooth or wrinkled dirty white layer on any of the ordinary mediums. Blood serum was rapidly digested, as was also the casein clot in milk. Acid was produced from dextrose, levulose, galactose, saccharose and mannite. We decided to test its pathogenicity after we had proved to our satisfaction that it really could be isolated from the blood of epileptics.

Dr. Reed kindly offered to allow us to make cultures in his cases, which was done by us in four cited below in conjunction with his bacteriologist, Dr. Hyatt. Not only could we not isolate such an organism but also we failed to find any bacteria in smears stained by the Giemsa stain and by Abbott's spore stain and other methods. Dr. Hyatt showed us a blood smear containing the "spores" of *B. epilepticus*. We were not able to pass on the nature of these bodies, which were about the size of the spores of *B. subtilis*. We will only say that we have been unable to find similar bodies in smears made by us. Our reason for limiting ourselves to the study of a few cases was influenced not only by the pressure of other work; we also hoped that by the use of special mediums, which we had found suitable for the growth of many delicately growing parasites, we might be able to isolate something overlooked heretofore.

We submit the following condensed notes on the cases in which we made cultures:

CASE 1.—Mr. B., Cincinnati General Hospital, was referred to us by Dr. Reed as particularly favorable on account of the frequent attacks of grand mal. Three separate blood cultures were made:

(*a*) Feb. 24, 1916, 5 c.c. of blood were taken between the frequent attacks and distributed in two flasks of +1 broth and several deep tubes of +1 glucose agar. These all remained sterile and were discarded after fifteen days' incubation at 37 C.

(*b*) March 6, 10 c.c. of blood were drawn one hour after a typical attack of grand mal in which the patient fell down and injured himself. The blood was immediately distributed among four flasks, each containing 400 c.c. +1 broth; 2 deep tubes of +0.5 Martin's medium; two deep tubes of +2.0 Martin's medium, and six tubes of +0.5 Martin's medium which were solidified in the slanting position and two of these were made anaerobic. These all remained sterile during two weeks' incubation at 37 C. Some of the sediment from the flasks was transplanted to +1 maltose and +1 human blood agar slants on the third day, but these subcultures too remained sterile.

(*c*) On the afternoon of March 6, the patient had a seizure, and while he was on the floor, Dr. Beizner drew 10 c.c. of blood and defibrinated it. This was distributed in flasks of +1 broth and +1 glucose broth and deep tubes of Martin's medium. After a month's incubation a few colonies of staphylococci were detected in some of the deep tubes of Martin's medium. The +1 broth flasks remained sterile, but a staphylococcus and a peculiar clostridium were isolated from the glucose-broth-blood culture. The clostridium multiplied very slowly in the blood sediment, and proved to be a partial tension organism. We have described its isolation in an article which is shortly to appear.[2] We subsequently encountered an aerobic strain of the same organism in a glucose-broth-blood culture in a case of phlebitis. Investigations showed that the clostridium had extremely resistant spores and probably came from the glucose.

After this we took care to autoclave all the mediums used in the following cultures ourselves.

CASE 2.—Mrs. H., Cincinnati General Hospital, was referred to us, February 28, by Dr. Roger Morris and Dr. T. H. Kelly. Blood was drawn from an arm vein two hours after a typical attack of grand mal. Five c.c. of blood were distributed in three aerobic agar plates, in four deep tubes of +0.5 Martin's medium, and in three flasks of +1 broth and one flask of +1 dextrose broth. These were incubated at 37 C. All these cultures remained sterile during twenty-two days' observation.

CASE 3.—From Miss G. R., aged 15, one of Dr. Reed's grand mal patients, from a private hospital, April 12, with Dr. Hyatt, we drew 10 c.c. of blood from an arm vein. About 5 c.c. of this were immediately distributed in one deep tube of +0.5 Martin's medium; two flasks containing 600 c.c. of +1 broth each and 1 flask containing 600 c.c. of +1 glucose broth, and into three +1 agar plates. The other 5 c.c. of blood were hemolyzed in sterile distilled water and taken back to the laboratory, where it was sedimented at high speed and the washed sediment and supernatant fluid planted in a variety of mediums. In all sixteen aerobic and anaerobic cultures were made in +1 glycerin agar, +0.5 Martin's medium, Martin's medium made up with monosodium phosphate, +0.5 Martin's pleuritic and on +1 human blood agar slants.

All of these cultures remained sterile during twenty-six days' observation, excepting that eight superficial colonies of *Staphylococcus albus* appeared on one of the +1 agar plates. This was discarded as an apparent contamination, as the room in the hospital in which the plates were made was dusty and drafty.

CASE 4.—Mr. L., aged about 45, one of Dr. Reed's cases, from a private hospital, had petit mal, but "has been growing worse." April 12, cultures were made from 10 c.c. of blood drawn at the same time and place as in Case 3. Cultures were distributed in the same way and in the same mediums. One plate showed a superficial colony of a large coccus. The rest of the cultures remained sterile as in Case 3.

CASE 5.—From Miss A. E., who had nocturnal attacks, referred by Dr. C. A. L. Reed, April 16, various types of mediums were inoculated with 10 c.c. of blood and incubated aerobically, at partial tension, and anaerobically with negative results during eight days' observation. About 2.5 c.c. of the blood was inoculated into ten tubes of +1 broth. Four of the tubes belonged to Dr. Hyatt. These we divided between us. Ours, including two of Dr. Hyatt's broth tubes, remained sterile. Dr. Reed later informed us that Dr. Hyatt had isolated the *Bacillus epilepticus* from one of the tubes taken by her.

CASE 6.—Mr. A., from the Jewish Hospital, one of Dr. Reed's patients, April 25, 1916, Dr. Reed notified us, was a

* From the Department of Bacteriology in the University of Cincinnati, Cincinnati General Hospital.

1. Reed, C. A. L.: The Bacillus Epilepticus, THE JOURNAL A. M. A., May 20, 1916, p. 1607.

NOTE.—We have for publication next week a paper by Dr. W. B. Terhune, of the East Louisiana Hospital for the Insane, giving his results, which apparently confirm Dr. Reed's claims as to the causative agent of epilepsy; also a comment by Dr. Reed on this article and the one by Caro and Thom which follows.

2. Wherry, W. B., and Oliver, W. W.: Jour. Infect. Dis., to be published.

favorable case. We could not go ourselves to collect the blood, but Dr. Hyatt kindly collected about 5 c.c. in sterile sodium citrate solution (1.5 per cent. furnished by us). Some of the blood had been discharged into tubes of plain broth (made by Dr. Hyatt). Two of these inoculated broth tubes were turned over to us for observation. The citrated blood was centrifuged. The citrate plasma was removed and the sediment hemolyzed with distilled water. The hemolyzed sediment and plasma were then centrifuged at high speed for one hour and the sediments planted in deep tubes of + 0.3 and + 1.0 Martin's medium containing sterile pleuritic fluid. Two plates of combined sediments were made; one was kept aerobic and the other at partial tension at 37 C. All the cultures showed no growth during two weeks' observation.

A BACTERIOLOGIC STUDY OF THE BLOOD OF SEVENTY EPILEPTICS

WITH SPECIAL REFERENCE TO THE BACILLUS EPILEPTICUS OF REED *

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The obscurity surrounding the fundamental causes of so complex a group of neurologic disorders as the epilepsies will, in itself, bring forth from time to time many new observations, both etiologic and therapeutic in nature. Recently, Dr. C. A. L. Reed of Cincinnati has written concerning the isolation of an organism believed by him to be the cause of the convulsion in so-called "idiopathic epilepsy." The value of such an observation can hardly be overestimated, particularly since it contains vast possibilities in the opening up of a new field of therapeutic endeavor. Accordingly, we felt it to be essential that this work should be corroborated, merely from the point of view of recovering the organism from the blood of epileptic patients.

A brief summary of Dr. Reed's work will aid in the presentation of the results of our investigations. In February, 1915, Dr. Reed[1] stated that "the rôle of constipation as a causative factor in epilepsy is due to the more than probable fact that the initial cause is to be found in a specific infection." So convincing was this conclusion that he felt the necessity of stating that it was probably a bacillus of the gas-forming group, which, together with its toxins, had the faculty of accumulating in the tissues and in the blood.

Following this hypothesis, Dr. Reed[2] reported the finding of a specific organism as the cause of "idiopathic epilepsy," which he believed to be the epilepticoccus. This organism consisted "of granular bodies, sometimes arranged in diplococci, sometimes in chains, sometimes in clusters, while in certain cases all these forms were present in a single case." It was to be found in the blood either just before or just after a seizure, but in the interim it disappeared. Growth of the coccus occurred readily on ordinary mediums, and animal experimentation fulfilled the third of Koch's laws. In conclusion, the presence of the epilepticoccus was stated definitely to be pathogenic for the disease.

In a later communication, Dr. Reed[1] stated that "epilepsy is an infection depending on a definite spore-bearing organism — the *Bacillus epilepticus*." The discarding of the epilepticoccus was explained briefly (in a footnote) on the basis of the changing morphology of the bacillus, as shown at different stages of its development. This had given rise to some confusion, and the discredited researches of Bra are quoted in defense of this change in the causative agent. In this paper, it was stated that cultures from the blood of epileptics showed the organism present in a large number of cases, more abundant immediately preceding or during a convulsion, although frequently found at other times, and, less readily, in "long interval" cases. The duration of the disease had no influence, apparently, on the finding of the bacillus, for mention is made of a case of more than twelve years' duration in which cultures were found positive. The organism was said to grow slowly in bouillon or on agar-agar (taking from two to five days), and to stain best with carbolfuchsin, although other stains could be employed. Finally, injection of pure cultures of the organism into rabbits was stated to produce a syndrome analogous to epilepsy in man.

Brief mention of the work of Bra may not be inadvisable at this point. In 1902, she[3] described the neurococcus as the essential cause of epilepsy. Besta, working in the laboratory of Ceni, failed to find the organism in a total of 375 cultures, of which 370 were sterile, the remaining five being contaminated. Ghiliarowsky of Moscow found the organism in insane patients (not epileptic), and concluded that it was a contamination. The following year, Tirelli and Brossa examined a total of fifty-eight cultures with negative results. Lannois and Lesieurs of Lyons also were unable to find the neurococcus.

With these facts in mind, we began an investigation along the lines taken by Reed and his assistants. In all, seventy cases of clinically idiopathic epilepsy, without any demonstrable organic lesion, have been studied. In this group were included forty-seven women and twenty-three men. In fifty-five of these patients no exciting cause could be found. In fourteen cases the exciting cause was given as: pregnancy, 2; pneumonia, 1; scarlet fever, 1; dentition, 3; indigestion, 3; pertussis, 2; rachitis, 1, and measles, 1. In this group, one case (blood taken during status) was included in which the assigned cause was given as "head injury," but necropsy failed to reveal any lesion of the calvarium or brain structures. The age of onset of the disease varied from infancy to 41 years (Table 1). The age at time of first known convulsion is here taken as the age of onset.

TABLE 1.—AGE OF ONSET

Age	Number of Cases
Before end of first year	8
Between age of 1 and 5	14
Between age of 6 and 10	24
Between age of 11 and 15	13
Between age of 16 and 20	4
Between age of 21 and 30	6
Between age of 41 and 45	1
Total	70

The duration of the epilepsy was from three to forty-five years; periods of remission, no matter what their length, are included in the duration (Table 2).

In regard to the incidence of constipation, on which Reed laid considerable stress, it was found that all of the seventy patients were suffering in varying degrees from this complication.

* From the laboratory and wards of the Monson State Hospital (for Epileptics), Palmer, Mass.

1. Reed, C. A. L.: The Bacillus Epilepticus: Third Report, The Journal A. M. A., May 20, 1916, p. 1607.

2. Reed, C. A. L.: Diagnostic Methods and Pathologic Constants in Idiopathic Epilepsy, The Journal A. M. A., Jan. 29, 1916, p. 336.

3. Bra: Recherches microbiologiques sur l'épilepsie.

Our routine method of examination consisted in the withdrawal of from 5 to 10 c.c. of blood from the median basilic vein. The blood flowed directly from the needle through a glass tube (connected to the needle by a short piece of rubber tubing) and into a test tube (200 by 20 mm.) holding 2 c.c. of a solution containing 0.6 per cent. sodium chlorid and 1.5 per cent. sodium oxalate. The oxalated blood was planted immediately on agar-agar slants and in bouillon. Each culture tube was inoculated with 1 c.c. of blood. The incubated cultures were not examined until the fifth day, unless a growth was noted on the agar slants, or turbidity of the bouillon occurred before that time. All apparatus used was subjected, for twenty minutes, to a temperature of 250 F. under 15 pounds' pressure.

TABLE 2.—DURATION OF EPILEPSY

Duration, Years	No. of Cases
1 to 5	8
6 to 10	15
11 to 15	13
16 to 20	6
21 to 30	22
31 to 40	5
41 to 45	1
Total	70

In all, eighty specimens of blood were obtained; ten of our cases were repeated. The total number of cultures was 160. Table 3 shows the relation of the specimens taken to the time of convulsions.

TABLE 3.—RELATION OF SPECIMENS TO TIME OF CONVULSIONS

When Taken	Number
During status	4
At cessation of grand mal seizure	10
At cessation of petit mal seizure	2
Within one hour after last seizure	29
Between 1 and 2 hours	10
Between 2 and 3 hours	6
Between 3 and 4 hours	2
Between 4 and 5 hours	3
Between 5 and 6 hours	2
Between 6 and 7 hours	1
Between 7 and 8 hours	3
Between 8 and 9 hours	1
Between 9 and 12 hours	3
Between 12 and 24 hours	1
None for several days	3
Total	80

The specimens obtained at cessation of grand mal seizures were taken as soon as the convulsive movements of the arms had quieted sufficiently to allow venipuncture to be performed. In the other cases, from one to eight grand mal seizures preceded the taking of the specimen. Two of the three patients free from seizures for several days were examined again at intervals of fifteen minutes and two hours, respectively, following a single grand mal seizure.

Examination of these cultures showed that 156 were sterile. Smears were made from every culture incubated, the lack of growth on the agar slant or clearness of the bouillon not preventing such procedure. Of the four cultures that showed growths, one (taken five hours after a grand mal seizure) showed staphylococci in bouillon. Another specimen of this patient's blood, obtained ten minutes after the last of a series of five seizures, gave sterile cultures on agar and in bouillon. The other three cultures all showed a similar organism. On a Petri dish (blood taken five hours after seizure), two colonies were found outside the areas over which the blood had spread. In the second case (taken twelve hours after a seizure), a similar colony was found on an agar-agar slant. In the third (taken during a grand mal seizure), a scanty growth was found in bouillon. All of these growths were found before the third day of incubation. With methylene blue as a stain, the organism was found to be a very large oval-shaped bacillus, with deeply staining ectosarc and pale staining protoplasm. It grew rapidly on agar-agar slants, and was distinctly fungoid in appearance. Injections of pure cultures, both intravenously and intraperitoneally, into a rabbit failed to produce any systemic disturbance, and ten days after the last injection the animal was returned to its mates. Feeling that this was a contamination, Petri plates were placed about the laboratory, and a similar organism was isolated. Fortunately, at about this time, Dr. Reed sent us a subculture of *Bacillus epilepticus*. Examination of specimens from it showed an entirely different organism from the contamination described above. All three of these cases were repeated either during or within fifteen minutes after the cessation of a grand mal seizure, and the cultures were found to be sterile.

In addition to the foregoing group of cases, two patients with hemiplegia were examined, one the day following the seizure and the other at the cessation of a convulsion. These cultures were sterile. Similar results were found in two cases with myoclonus. Both specimens were taken within a half hour after a grand mal seizure.

In a personal communication, Dr. M. M. Canavan,[4] assistant pathologist to the Massachusetts State Board of Insanity, has given us the results of postmortem cultures from seventeen epileptics on whom necropsies were held during the past year. In every instance, from two to seven loci were studied for bacteriologic infection, and these have included always the heart's blood. In three of these cases, all cultures were found to be sterile, a total of thirteen loci being studied. In the remaining fourteen necropsies, with a total of seventy loci investigated, Dr. Canavan was unable to find any organism approaching the morphology of *Bacillus epilepticus* as described by Dr. Reed.

SUMMARY

1. In a series of seventy cases, with a total of 160 blood cultures, there were 156 sterile cultures. The remaining four showed contaminations.

2. Four cases with either myoclonus or hemiplegia also gave sterile blood cultures.

3. In a series of seventeen necropsies on epileptics, Dr. Canavan, in a bacteriologic study, was unable to find any organism resembling *Bacillus epilepticus*.

4. In conclusion, it would seem evident that, in the seventy epileptic patients studied, the epileptic syndrome was not due to the *Bacillus epilepticus* of Reed.

New Method of Antral Cleaning with Trochar.—For some time it has been my practice after insertion of a trochar through the wall of the inferior meatus into the antrum of Highmore to proceed as follows: The point of the trochar is turned downward so that it comes as near the floor of the antrum as possible. Both nostrils are then closed around the trochar tube with the finger, and the patient blows forcibly. This puts air pressure via the ostium maxillaris into the antrum, and forcibly blows out the pus through the cannula. It is much better to use a cannula of good size, and one has to manipulate it a few times to be sure the inner end is free. I believe that this method practically empties the antrum of fluid, which the ordinary method with a trochar does not do.—A. C. HEATH, M.D., St. Paul.

4. Personal communication from Dr. Canavan to Dr. Thom, dated June 29, 1916.

Therapeutics

THE TREATMENT OF DIABETES

(*Continued from page 1021*)

THE DIET

Addition of Carbohydrates to the Diet.—When, as a result of the fast, the urine has been free from sugar for twenty-four hours, feeding may be cautiously begun. All the food given must be weighed and its composition must be known approximately, at least. Unless this is done, no accurate idea of the food tolerance or of its caloric value can be obtained, and subsequent treatment becomes of necessity a "hit-or-miss" affair, with the probabilities all in favor of its being a "miss." Information as to the composition of the common foods may be obtained from various treatises on dietetics and food chemistry.[5]

The accompanying table, compiled by Joslin,[6] contains in a compact form all the essential information. The figures, although only approximate, are sufficiently accurate.

A convenient scale for weighing food is the movable dial spring balance, made by John Chatillon and Sons (85 Cliff Street, New York). With this balance it is a simple matter to allow for the weight of the receptacle.

Feeding is begun with food containing but small amounts of carbohydrate and lesser amounts of protein and fat. The most satisfactory diet to begin with is one composed exclusively of green vegetables of the "5 per cent. group" (see table). These vegetables, although they contain but little available nutriment, have a large bulk and serve to fill the stomach, thus allaying in some measure the pangs of hunger. The indigestible residue is valuable in preventing constipation. From 150 to 200 gm.[7] of the vegetables of this group are given the first day. Approximately 5 gm. of *available* carbohydrates are contained in this amount. If no glycosuria occurs, the diet on the second day may contain vegetables equivalent to five more grams of carbohydrate, and this increase is made daily until 20 gm. of carbohydrate are given. Following this, 5 gm. are added every other day until glycosuria occurs or the patient is receiving as much as 3 gm. of carbohydrate per kilogram of body weight in twenty-four hours (Joslin). After the first day or two carbohydrate may be given in the form of vegetables of the 10 per cent. group, followed subsequently by those of the 15 and 20 per cent. groups. Fruits are then added, and ultimately, if glycosuria has not supervened, bread and oatmeal.

Ordinary bread is but seldom included in the dietary of the diabetic. There are on the market a large number of brands of "gluten" and "diabetic" flour which contain relatively little carbohydrate and much protein. Bread made from such flour, provided the composition is accurately known, may be eaten. These special brands of flour, however, are expensive and many are fraudulent.[8]

5. Useful books are: Locke: Food Values, New York, D. Appleton & Co. Atwater and Bryant: The Chemical Composition of American Food Material, Bull. 28, Office Experiment Station, U. S. Dept. Agric.

6. Joslin: Am. Jour. Med. Sc., 1915, cl, 485.

7. Vegetables are best cooked by steaming in a double boiler, as in this way nothing is lost.

8. Street, J. P.: Diabetic Foods Offered for Sale in the United States, THE JOURNAL A. M. A., June 28, 1913, p. 2037. Street and Mendel: Diabetic Foods, Rep. Connecticut Agric. Expt. Station, 1913, Pt. 1, Sec. 1.

JOSLIN'S DIET TABLE

Strict Diet—Meats, Fish, Broths, Gelatin, Eggs, Butter, Olive Oil, Coffee, Tea and Cracked Cocoa

FOODS ARRANGED APPROXIMATELY ACCORDING TO PERCENTAGE OF CARBOHYDRATES

Vegetables

5 Per Cent.	10 Per Cent.	15 Per Cent.	20 Per Cent.
Lettuce Spinach Cauliflower Sauerkraut String beans Celery Asparagus Cucumbers Brussels sprouts Sorrel Endive Dandelions Swiss chard Sea kale Tomatoes Rhubarb Egg plant Leeks Beet greens Watercress Cabbage Radishes Pumpkin Kohlrabi Broccoli Vegetable marrow	Onions Mushrooms Squash Turnip Carrots Okra Beets	Green peas Art chokes Parsnips Canned lima beans	Potatoes Shell beans Baked beans Green corn Boiled rice Boiled macaroni

Fruits

Ripe olives (20 per cent. fat) Grapefruit	Lemons Oranges Cranberries Strawberries Blackberries Gooseberries Peaches Pineapple Watermelon	Apples Pears Apricots Blueberries Cherries Currants Raspberries Huckleberries	Plums Bananas

Nuts

Butternuts Pignolias	Brazil nuts Black walnuts Hickory Pecans Filberts	Almonds Walnuts (Eng.) Beechnuts Pistachios Pinenuts	Peanuts 40 Per Cent. Chestnuts

5 Per Cent.

Miscellaneous.—Unsweetened and unspiced pickles, clams, oysters, scallops, liver, fish roe

Reckon *actually available* carbohydrates in vegetables of 5 per cent. group as 3 per cent., of 10 per cent. group as 6 per cent.

Thirty gm. or 1 ounce, of each of the following contain approximately:

	Protein, Gm.	Fat, Gm.	Carbohydrates, Gm.	Calories
Oatmeal, dry weight	5	2	20	110
Meat (uncooked)	6	2	0	40
Meat (cooked)	8	5	0	60
Broth	0.7	0	0	3
Potato	1	0	6	30
Bacon (cooked)	5	15	0	155
Cream, 40 per cent.	1	12	1	120
Cream, 20 per cent.	1	6	1	60
Milk	1	1	2	20
Bread	3	0	18	90
Butter	0	25	0	230
Egg (one)	6	5	0	75
Brazil nuts	5	20	2	230
Orange (one)	0	0	10	40
Grapefruit (one)	0	0	10	40
Vegetables, 5 and 10 % groups	0.5	0	1	6

1 gm. protein, 4 calories.
1 gm. fat, 9 calories.
6.25 gm. protein contain 1 gm. nitrogen.
30 grams (gm.) or cubic centimeters (c.c.), 1 ounce.
A patient "at rest" requires from 25 to 30 calories per kilogram body weight.
1 gm. carbohydrate, 4 calories.
1 gm. alcohol, 7 calories.
1 kilogram, 2.2 pounds.

The patient's longing for bread may, in a measure, be satisfied by bran biscuits. These contain no carbohydrate and serve as a convenient vehicle for the administration of butter or other fats. The bulky residue fills the stomach and relieves constipation.[9]

The appearance of glucose in the urine means that the patient's assimilative limits have been exceeded and a fast must be instituted until the glycosuria ceases.[10] Following the fast, the carbohydrate ration should be diminished by one half and not increased beyond this amount for some days and then very cautiously. The amount should be kept well within the limit of tolerance previously determined for a considerable period of time. Subsequently, if there is reason to suppose the patient can assimilate more carbohydrate, the limit of tolerance may again be determined by gradual addition of carbohydrate, even to a point in excess of the former tolerance.

In severe cases some patients cannot assimilate even the small amount of carbohydrate contained in green vegetables, although they may still be able to assimilate minimal amounts of protein and fat. Such patients may be given at first green vegetables that have been cooked in three changes of water and the water discarded. Vegetables so prepared contain practically no carbohydrate.

Addition of Protein to the Diet.— In severe cases of diabetes, it is advisable to determine the protein tolerance in essentially the same way that carbohydrate tolerance is determined, eggs and meat alone being fed in increasing amounts until glycosuria occurs. In most cases of diabetes, however, protein may, to advantage, gradually be added to the diet during the period of testing the carbohydrate tolerance. During the first week of green vegetable feeding, provided no glycosuria occurs, two or three eggs may be given during the day. Lean meat is then added from day to day in amounts corresponding to 10 or 15 gm. of protein (see table) until the patient is receiving daily about 1 gm. of protein per kilogram of body weight, or if the carbohydrate tolerance is zero, only 0.75 gm. Later, if desired, protein may be raised to 1.5 grams per kilogram of body weight (Joslin), provided, of course, this can be done without the development of glycosuria. Children may to advantage be given as much as 2 gm. of protein per kilogram.

Addition of Fats to the Diet.—When the amount of protein fed has reached 1 gm. per kilogram of body weight, fats may be added to the diet in gradually increasing amounts (25 gm. a day) until the caloric requirement of from 25 to 40 calories per kilogram of body weight is covered by the total food intake. Patients who are exercising require a higher caloric intake than when resting, and growing children up to as much as 50 or 60 calories per kilogram, depending on the age. The caloric intake should eventualiy be such that a progressive loss of weight does not occur. On the other hand, the patient must not gain in weight, or, more correctly, he must not gain in adipose tissue, though muscular development is allowable.

Fat, besides that obtained in the eggs and meat fed, may be supplied in the form of bacon, cream, olive oil or butter. If marked acetonuria appears, it is advisable to substitute olive oil for butter and cream.

Weekly Fast Days.— For a long time it has been recognized that days of partial or complete fasting are of benefit to the diabetic. Allen has incorporated this idea into his system of treatment, and advises frequent fast days. Joslin's rule is to fast all patients once a week whose tolerance for carbohydrates is less than 20 gm. When the tolerance is between 20 and 50 gm., 5 per cent. green vegetables and one-half the usual quantity of protein and fat are allowed on the fast days; when the tolerance is between 50 and 100 gm. of carbohydrates, the 10 and 15 per cent. vegetables are allowed as well. If the tolerance is more than 100 gm. of carbohydrate, the carbohydrate intake is halved on the weekly fast days.

(To be continued)

9. The recipe used at the Rockefeller Institute Hospital is:

Bran	60 gm.
Salt	¼ teaspoonful
Agar agar, powdered	6 gm.
Cold water	100 c.c. (½ glass)

Tie bran in cheese cloth and wash under cold water tap until water is clear. Mix agar agar in the water (cold) (100 c.c.) and bring to the point of boiling. Add to washed bran the salt and agar agar solution (hot). Mold into three cakes. Place in pan and, when firm and cold, bake in moderate oven from forty-five to fifty minutes.

Powdered agar agar is to be had at Munsch-Protzmann, 410 Madison Avenue, New York.

10. Frequently a slight glycosuria may disappear in twenty-four hours, without any dietary change.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLE HAS BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

BARIUM SULPHATE FOR ROENTGEN-RAY WORK.—Barium sulphate freed from soluble barium salts.

Action, Uses and Dosage:—Barium sulphate for Roentgen-ray work, being freed from soluble barium and other salts, passes through the system unchanged and because of this is used in taking Roentgen-ray pictures of the stomach and of the intestines.

For the Roentgen-Ray Examination of the Stomach:—The evening before the examination the patient receives 1 fluid-ounce of castor oil. In the morning an ordinary portion of wheat-meal porridge with which 2 ounces of barium sulphate have been well mixed, together with a little sugar and cream, is administered by mouth. The patient is then directed to abstain from further food. The examination is made six hours later.

For the Roentgen-Ray Examination of the Colon:—An enema consisting of 16 ounces of mucilage of acacia, 3 pounds of condensed milk, and 8 ounces of barium sulphate is warmed to body temperature and injected into the rectum from a height of from 3 to 6 feet. The examination is made with a fluoroscope while the injection is passing into the rectum.

Barium sulphate for Roentgen-ray work is a fine, white odorless, tasteless and relatively light powder, which is insoluble in water and organic solvents as well as in acids and in dilute alkalies.

Boil 10 Gm. of barium sulphate for Roentgen-ray work with a mixture of 10 Cc. of acetic acid (Sp. Gr. 1.064) and 90 Cc. of water and filter. Evaporate 25 Cc. of the filtrate to dryness, dissolve the residue in 20 Cc. of water and filter (return the filtrate to the filter until quite clear) and to the filtrate add a few drops of dilute sulphuric acid; no separation of barium sulphate should occur within one-half hour (soluble barium salts). Saturate another 25 Cc. portion of the acetic acid extract with hydrogen sulphide: it should not become colored or turbid (heavy metals).

Boil 2 Gm. of barium sulphate for Roentgen-ray work for a few minutes with 10 Cc. of nitric acid (Sp. Gr. 1.149 to 1.152) and filter: the filtrate does not give a yellow precipitate with ammonium molybdate solution within half an hour (barium phosphate).

Triturate 2 Gm. of barium sulphate for Roentgen-ray work with 10 Cc. of stannous chloride solution: no dark coloration occurs within one-half hour.

Boil 10 Gm. of barium sulphate for Roentgen-ray work with 50 Cc. of water containing 1 Cc. of hydrochloric acid, U. S. P., and filter: the clear filtrate shows no spectral line for barium.

Barium Sulphate-Squibb for Roentgen-Ray Work.—A non-proprietary brand complying with the standards for barium sulphate for Roentgen-ray work.

Manufactured by E. R. Squibb and Sons, New York.

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SATURDAY, OCTOBER 7, 1916

THE EFFICIENCY OF THE DIAPHRAGM

Considered as a muscle, the diaphragm performs a unique service to the body exceeded or equaled only by the musculature of the heart. From birth to death it continues to carry out a series of orderly contractions at fairly regular intervals with a degree of regularity and rhythm that challenges our interest in much the same way as do the cardiac contractions, when attention is once directed to the unremitting muscular performances in respiration. The position, the structure and the normal behavior of the diaphragm are unique; and it is strange, indeed, as a recent writer reminds us, that more physiologic facts have not been available regarding the functional properties of a tissue which, from the standpoint of importance to the individual, ranks highest of all skeletal muscles. Accordingly we welcome the publication of recent investigations, from the Department of Physiology at Columbia University, respecting the comparison of the diaphragm with a series of other muscles of unlike properties and physiologic make-up.[1] The behavior of the diaphragm under various experimental conditions has been contrasted with that of certain muscles of the leg, such as the extensor longus digitorum, the sartorius and the soleus, and at times the muscular tissue of the heart. The extensor and the sartorius were chosen as typical pale muscles, the soleus as the type of red muscles. The diaphragm appears intermediate between these two in color. In physiologic properties, however, color appears to be a feature of limited significance.

According to Lee and his collaborators, the most common order in which the several muscles may be arranged as to the quantitative development of the various general physiologic properties is: diaphragm, sartorius, extensor, soleus. The properties appear least pronounced in the red soleus, and next in the two pale muscles, with the sartorius slightly in the lead. As to most of the properties, the diaphragm stands by itself in the lead of all the others. Its tissue possesses the greatest reducing power, in other words, the greatest power to remove oxygen from its environment, and this power is probably dependent on the existence of an enzyme; its content in peroxidase is greatest; the irritability of the excised diaphragm to single induction shocks, while surpassed in degree at first by both the extensor and the sartorius, survives long after all the other muscles have died; in the brevity of its latent period, the excised diaphragm is surpassed only by the extensor.

As a working mechanism the diaphragm is now experimentally demonstrated to be vastly superior to all the other muscles studied. It lifts a greater load, it is capable of lifting it to a greater height, it continues to work for a longer time, and it performs before it becomes exhausted a much greater amount of labor. All of these powers are greatly to its advantage in the important rôle which it plays.

Other features further testify to the superior efficiency of the diaphragm for the uses to which it is devoted. Its greater resistance to fatigue is exhibited in its longer working period and its greater work accomplished before becoming exhausted; it, with possibly some other respiratory muscles, is the last skeletal muscle of the body to submit to the paralyzing action of curare; other investigators have pointed out its greater tendency than other parts of the body to harbor trichinae — a peculiarity that is not yet explained, but may possibly be associated with the greater power of the diaphragm to utilize oxygen; when the body is subjected to high heat and high humidity, all the muscles are affected deleteriously, which is manifested in a diminution of the working period and the total work which can be accomplished before exhaustion sets in, but the diaphragm is affected far less than the other muscles; by extreme inanition the total working period of the excised diaphragm is shortened far less than that of the extensor, although the total work which can be performed by the former is diminished to a greater degree — a fact which may possibly be associated with the greater activity of the diaphragm. Among the muscles examined, the glycogen content — often taken as an index of reserve energy — is greatest in this organ.[2]

Not only in its contractile capacity but also in its power of resistance to deleterious influences, the diaphragmatic muscle commands a superior position. Most of these facts, Lee and his co-workers remark, indicate that the diaphragm possesses much more efficient muscular tissue than do the other muscles — in other words, it is a superior physiologic mechanism. This is exactly what might be expected, when the unique and superior rôle of the diaphragm among skeletal muscles is considered. Here, they conclude, seems to be a striking instance of physiologic adaptation to physiologic requirements.

1. Lee, F. S.; Guenther, A. E., and Meleney, H. E.: Some of the General Physiological Properties of Diaphragm Muscle as Compared with Certain Other Mammalian Muscles, Am. Jour. Physiol., 1916, xl, 446. Lee, F. S.; Scott, E. L., and Colvin, W. P.: Some of the Chemical Properties of Certain Mammalian Muscles, ibid., p. 474.

2. Lee, F. S.; Scott, E. L., and Colvin, W. P.: Some of the Chemical Properties of Certain Mammalian Muscles, Am. Jour. Physiol., 1916, xl, 474.

THE LOWER ANIMALS AND HUMAN DISEASE

Only a few years ago Lee[1] wrote:

From time immemorial human life has been cursed by the two great evils of war and pestilence. Working at times together, at times apart, there is no portion of the earth and no race of men that they have not devastated. The one has slain its thousands, the other its millions, and sorrow and misery have ever accompanied and followed them. Ages have come and gone, while through them all the clash of arms has sounded and murderous plagues have silently spread unchecked. Now in the morning of the twentieth century the moral nature of man has risen against the one of these evils, and all his science is invoked against the other; and there is ground for the great hope that when our century passes away, they also will pass, and man will be freed forever from two of his greatest burdens.

Whether the conquest of war is in sight is a question that may be left for debate to those who are watching the struggles in the present European conflict. The possibility of a human conquest of infectious diseases looms up with the prospect of some success when the experience of the past few decades forms the background. Since Pasteur's day that remarkable group of primitive forms called bacteria has been the center of attention. Among the fifteen hundred species that have been described there are not a few enemies of mankind. The earlier investigators in the new science of bacteriology directed their energies toward a study of the distribution of these micro-organisms, their modes of entrance and exit into the human body, the toxic products and dangerous lesions which they produced, and likewise to the ways in which the organism attempts to repel the attacks or prevent the ravages of unwelcome microbial invaders. A science of immunology has been developed; protective or curative therapy has been devised; preventive measures have been successfully instituted. The achievements have been notable, and there is still abundant opportunity for additional progress.

In almost every field of science there comes a tendency at times to view the impending problems from somewhat similar angles and to apply the familiar tested methods of procedure to their solution. Advancement becomes progressively slower and more difficult until some pioneer breaks through the confines of the conventional and enters new paths of progress. New methods, new observations — the creation of a new avenue of approach illuminated by an unbiased attitude in place of the traditional or the customary — these are the antecedents of novel discoveries. These thoughts of the frequent necessity for travel along unbeaten paths in scientific medicine are prompted by the recognition of the important part played by the lower animals in relation to human disease and an increasing appreciation of how manifold the interrelations are. No single rule can be applied to recognize or control or prevent the numerous forms of disease dependent in some way or other on man's relation to animals.

Some impression of the importance and of the large number of diseases of man carried by the lower animals is afforded by a partial résumé recently prepared by Davis[2] of the University of Illinois College of Medicine in Chicago. He has enumerated more than sixty known illustrations of human diseases transmitted by over twenty animal species. This exemplifies how man's relations and points of contact with a large variety of the lower animals are more intimate and complex than those of any of the other animals to other species; and as a result of such relations, on the whole, the disease transmission from animals to man is naturally increased in number and variety. This is one of the penalties that man pays for being nurse, doctor and master of the brute creation.

The modes of transmission of disease from animals to man are varied, and some of them are well recognized. Davis recalls that infection in man may occur through simple contact with diseased animals. The infectious agent may be carried mechanically from person to person or from animal to person through food or otherwise by a second animal. The animal may through a bite produce a lesion into which the infectious agent is transferred. The parasite may be transmitted to man through the meat of lower animals used as food. The infectious agent may be transmitted to man through the secretions of the lower animals. The infectious agent may enter one of the lower animals, in which it passes through a regular phase or completes a cycle and then, usually through a bite of the animal, is transmitted to man.

A few somewhat extraordinary instances deserve to be repeated in illustration of the unexpected diversity of the relationships of animals to man in respect to disease. Recently an outbreak of several cases of anthrax occurred in England which after considerable difficulty was traced to the use of infected shaving brushes. The anthrax bacilli were recovered from the used brushes as well as from new brushes from the same stock obtained in a store. They were made with hair from a diseased animal. Malta fever is transmitted largely through the milk and urine of goats infected with *Micrococcus melitensis*. The difficulty of recognition of the source of the infection lies in the fact that in most of these animals there are no symptoms whatever, the micrococcus being found in the secretions of animals perfectly healthy and which remain so. The problem of the healthy carrier thus applies to the lower animals in this new relation. Again, over thirty milk-borne epidemics of streptococcus sore throat are already on record. It would now seem that in some instances virulent streptococci of the human type may find their way into the udder of the cow through the contaminated hands of the milker and there multiply and return subsequently in large numbers in the milk and infect the consumer. Some of these epidemics and

1. Lee, F. S.: Scientific Features of Modern Medicine, New York, 1911, p. 64.

2. Davis, D. J.: On Certain Relations of the Lower Animals to Human Disease, Science, 1916, xliv, 337.

perhaps many of them have originated thus. Still different is the acquirement of disease where more than one species of transmitting agent is concerned. For example, Davis reviews how most interesting relationships exist in this connection between some of the nematoda and the trematoda or fluke infections in man and certain small water animals, including crabs, snails and other arthropods. For example, the guinea-worm, a filarial parasite in man, lives in the tissues, and at times the female bores outward through the epidermis, discharging the embryos which, if they find water, swim about and enter a small crustacean, the waterflea or cyclops, in which they remain for several weeks undergoing certain transformations. Finally they may enter the stomach of man through drinking water and then bore through the stomach wall into the tissues again.

We must be prepared to appreciate and particularly also to educate the public to an understanding that though the most universal mode of transmission of the more widely distributed infectious diseases is through contact with an infected person and infected personal articles, this is by no means the sole mode of dissemination. Our study of disease in medical and veterinary institutions, says Davis, should be at least as broad and as comparative as is the study of zoology or botany. In order to understand the natural history of many diseases, comparative studies are absolutely necessary. It would undoubtedly be advantageous both from a humane as well as from a scientific standpoint, he adds, if our medical schools and hospitals, our veterinary hospitals and even our cat and dog hospitals and other places for the care of sick animals could all be concentrated in one institution for the broad study of disease.

DIETARY TOXICITY VERSUS DEFICIENCY

The prominence given to the question of dietary deficiencies in the more recent investigations and discussions of the pathology of metabolism has, very properly, directed consideration to factors of nutrition and disease not until now adequately appreciated. Enthusiasm for new discoveries or promising ideas proverbially tends to concentrate attention on that which is presumably novel; and incidentally there is a liability to overlook other highly important factors which are not, for the moment, in the center of interest. Thus, when unusual interest in the toxic performances of some variety of micro-organism is dominant, there is liable to be a tendency to overlook the equally significant powers of defense of the host; or, again, when some unexpected portal of entry for noxious germs into the body is brought into prominence by a new observation, the other possibilities of bacterial invasion are liable to be temporarily overlooked or minimized, if not entirely forgotten.

An illustration of what has just been indicated is suggested by recent researches from the Departments of Agricultural Chemistry and Anatomy at the University of Wisconsin.[1] In a noteworthy investigation[2] reported in 1911, it was pointed out that a ration from the wheat plant — wheat grain plus wheat straw — was wholly inadequate with heifers for reproduction and in some instances for continued growth. With swine, confined to the wheat grain and a suitable salt mixture, growth soon ceased and the animals passed into a poor condition, while a corn and salt mixture ration was at least sufficient for slow growth and continued well-being.[3] Since then our ideas of what constitutes an adequate ration have been considerably expanded.[4] The nature of the so-called deficiency diseases or avitaminoses has been widely discussed in relation, among others, to beriberi, scurvy, rickets and pellagra. It may be stated, in a general way, "from the extensive data now available, that certain at present unidentified substances aside from protein, carbohydrates, fats and salts are indispensable for growth or prolonged maintenance, and furthermore that there is a class of such accessories soluble in fats and another soluble in water and alcohol." Furthermore, "it seems highly probable that, while the amount of accessory substances of either of these classes which is required to induce growth is small, the evidence points to the belief that a certain quantity must be present before any growth can take place, and that above this amount, growth seems to be in some measure proportional to the amount of accessories present."[5]

Evidence seems to be at hand that in certain defects of nutrition, presumably of dietary origin because they can be corrected by alterations in the food, we have to deal, not with a true deficiency in the diet, but with some inherent substance in the ration that is either interfering with the use of certain constituents necessary for perfect nutrition, or is directly causing nutritional disturbances. Hart, Miller and McCollum[1] have now found apparently that certain wheat rations produce pathologic conditions, with histologic pictures analogous to those seen in the polyneuritis of fowls, as the result of an inherent toxicity, as well as by a deficiency in the food supplied. Malnutrition, histologically characterized by nerve degeneration, may result from the absence of certain factors in the diet, as in the case of beriberi. A similar condition may

1. Hart, E. B.; Miller, W. S., and McCollum, E. V.: Further Studies on the Nutritive Deficiencies of Wheat and Grain Mixtures and the Pathological Condition Produced in Swine by Their Use, Jour. Biol. Chem., 1916, xxv, 239.

2. Hart, E. B.; McCollum, E. V.; Steenbock, H., and Humphrey, G. C.: Research Bull. 17, Wisconsin Experiment Station, 1911.

3. Hart, E. B., and McCollum, E. V.: Jour. Biol. Chem., 1914, xix, 373.

4. Compare, for example, Mendel, L. B.: Nutrition and Growth, The Journal A. M. A., May 8, 1915, p. 1539. McCollum, E. V., and Davis, M.: Jour. Biol. Chem., 1915, xxiii, 181. A Report on Nutrition in a German Internment Camp, editorial, The Journal A. M. A., July 8, 1916, p. 125.

5. McCollum, E. V., and Davis, M.: The Essential Factors in the Diet During Growth, Jour. Biol. Chem., 1915, xxiii, 231.

likewise arise from the presence of toxic materials in apparently normal food products, and in the presence of all known factors essential for continued growth and well-being. The newer investigations of the Wisconsin workers indicate that with a large mass of wheat in the ration of swine, toxicity will follow even in the presence of all the recognized factors for growth. Only in the presence of very liberal quantities of all these factors can the effect of the toxicity be overcome. One almost inevitably thinks of the cottonseed feeding problem in this connection. The lesson of these significant observations may be summarized in the words of the investigators: For normal nutrition with natural foodstuffs not only must there be a plentiful supply and proper constitution of the foregoing essential factors, but also a supply sufficient to overcome any inherent toxicty or else an absence of the toxicity itself. Of course it is assumed that some kinds of toxicity of natural foodstuffs can be overcome by a plentiful supply of the normal factors of nutrition. They may not always be possible.

OFFICE HYGIENE

One of the most important business centers of the world, the City of London, was credited in the census with a night population of about 26,000. During the day, this district contains from 1,000,000 to 1,500,000 persons, a great number, perhaps a majority, of whom are employed in office buildings. In most great cities a similar state of affairs exists. The conditions under which these diurnal inhabitants work have received little attention from sanitarians, who have devoted themselves chiefly to the investigation and amelioration of the working environment of industrial employees and schoolchildren.

Recently, under the auspices of the Department of Health of New York City, a sanitary survey was made of a typical city block containing buildings of different types from the oldest to the most modern. The results as regards lighting and ventilation were published in the monthly bulletin of the department.[1]

It is natural that architects and others responsible for the construction of office buildings should attempt to produce a favorable impression on the prospective tenant. The majority of tenants are, from past experience, capable of forming a fairly sound judgment on the heating arrangements of a building; they are also easily satisfied with the illuminating devices, provided the esthetic effect is good and there is enough light. It follows that insufficient attention is likely to be paid to the amount and distribution of the light on the working surfaces of the employees' desks. In respect to lighting, the most important defects are the two extremes of insufficient light of any kind and an excess of artificial light. In the New York survey it was found that less than 15 per cent. of the employees had access to natural light, and even of these many were obliged to supplement it with artificial light. Under such circumstances, the importance of ascertaining what are the best means and quantity of illumination is evident. The most satisfactory working conditions, from the physiologic point of view, for typists and bookkeepers are found to be the use of duly shaded sources of light, about 19 inches above the working surface and of such intensity that one square foot of white surface reflects light equivalent to eight or nine standard candles (eight or nine "foot candles"), the general illumination of the office being secured by ceiling lights. Health is ameliorated, comfort and efficiency increased by improved lighting, which generally means, in this case, a proper shading of the eyes from direct rays and a greater diffusion of the light with, as often as not, a considerable reduction in its intensity. In the most expensive installations, high power modern lamps are frequently combined with metallic reflectors, concentrating a brilliant disk of light on a small portion of the working surface and leaving the surroundings comparatively dark. This produces a contrast which experience has shown is fatiguing to every retina and even seriously harmful to some.

With regard to the problems of atmospheric conditions such as the purity, the movement and the humidity of the air, the prospective tenant is generally wofully ignorant. Moreover, it would be difficult for any one but an expert ventilation engineer to pass judgment on the efficiency in winter of what is known as "air conditioning" apparatus from the results of an examination made of an empty building in summer.

Under this head, the findings of the New York report are what would be expected in view of the considerable experience accumulated during the last few years. The actual amount of space available for each person was generally sufficient, but ventilation was unsatisfactory because, the nature of the building and its surroundings tending to cause drafts, the windows were not kept open during cold weather and the few inside openings such as transoms, when existing, were not in use.

In respect to the three atmospheric elements of working conditions, ventilation, temperature and humidity, this report is not so extensive as that issued after a similar survey by the Chicago Commission on Ventilation.[2]

The findings, the methods and the recommendations of the latter commission will repay study by all who are interested in this subject. Briefly stated, the principal recommendations were: that the air should be washed and filtered; that, whenever possible, upward ventilation should be used, that air currents impinging directly on persons should have a temperature not

1. Monthly Bulletin of the Department of Health of the City of New York, August, 1916, vi, No. 8.

2. Chicago Commission on Ventilation, Report, 1914.

below 60 F.; that the humidity of the air should not be allowed to fall below 40 per cent. of saturation, and that the temperature should be maintained at about 68 F. This is ideal, of course, but it would be both difficult and prohibitively expensive to adapt existing buildings to meet all exigencies of such a system. This, however, is less true of the lighting arrangements and the control of humidity, and it would be found true economy in the construction of new buildings to design the heating, ventilating and lighting plant in accordance with the indications of sanitary science.

It is now well established that the principal defect of air conditions in centrally heated buildings is the fact that in raising the temperature of the air, steps are not taken to insure a due degree of humidity. Warm air holding less than 40 per cent. of its potential humidity is irritating to the respiratory passages and is far more easily contaminated by dust, dried sputum and other objectionable particles. A number of satisfactory automatic and semiautomatic devices for regulating the humidity of the atmosphere are in use.[3] Some of these can be adapted to existing buildings and others cannot. For the greater part of the United States, there is little fear of overcharging the atmosphere with moisture during the winter. Simple evaporating devices adapted to existing radiators will therefore be found satisfactory in relatively small rooms. In larger rooms the same method may be employed, if the humidity is uniformly distributed by appropriately placed fans. It should be unnecessary to say that the best way of purifying the atmosphere is not by adding foreign materials to it but by introducing fresh air. All of the much advertised products recommended to be added to the water evaporating on radiators are worthless and serve only to transfer money from the pockets of the credulous to those of the exploiting class.

A NEWLY DISCOVERED FUNCTION OF THE BONE MARROW

The clotting of blood is a complicated process from the standpoint of the chemical changes concerned in it. Most of the essential facts of the phenomenon are now clearly recognized; but the theory of coagulation still remains shrouded in considerable mystery. The literature of the subject, which has received voluminous additions for more than half a century, is so largely confused by the variable nomenclature and unlike designations for the same features, that the untrained person will find it difficult to unravel the strands of the intricate meshwork of description and speculation. The fundamental rôle of the soluble blood protein fibrinogen, which is converted into fibrin when the blood clots, and the failure of the clotting process to be accomplished in the absence of soluble salts of calcium, are quite generally recognized. A further factor is found in what was formerly designated as fibrin ferment, but more recently thrombogen or prothrombin, to indicate the antecedent of a substance that plays a significant part in the formation of fibrin.

As delayed or inadequate clotting of the blood is of no little moment to the welfare of the individual, and is a symptom of various pathologic conditions, precise information respecting all of the factors indispensable for coagulation is imperative for any rational therapeutic procedure in certain diseases. If fibrinogen is lacking, the organs that normally supply it must be stimulated to their usual normal performance. Similar reasoning is applicable to the other essential contributors to the clotting of the blood. In recent years a more accurate determination of the nature of the deficiency in cases of unsatisfactory coagulation has become possible. Methods for remedying the discovered defects are not yet thoroughly satisfactory.

Prothrombin has been believed by different investigators to rise from one or more of all the familiar formed elements of the blood. At present there seems to be no doubt, however, that thoroughly washed mammalian erythrocytes do not yield prothrombin. Its possible origin from leukocytes disintegrating in the blood has become doubtful, to say the least. There is no question, however, that prothrombin arises from blood platelets; indeed, the disintegration of the latter elements accompanies the act of coagulation and seems to be one of the first features in it. Low platelet counts are known, furthermore, to be associated with certain tendencies to bleeding, and the lack of plâtelets has been held responsible for the deficient coagulation.

In the course of experiments conducted in the physiologic laboratory of the Johns Hopkins University on the perfusion of bone marrow, Drinker[1] has observed an unexpectedly large amount of prothrombin in the perfusing fluid after it has passed through the marrow. In regard to the cells of origin of this prothrombin, there is no tenable evidence that it comes either from leukocytes, lymphocytes, myelocytes, nucleated red cells, or wandering epithelial cells, all of which may be found in the marrow. On the other hand, the blood platelets are known to contain prothrombin, and the origin of the plates from the megacaryocytes of the marrow is said to be well established. The latter structures are, accordingly, the probable source of the marrow prothrombin. The discovery that bone marrow is an important and specialized source of prothrombin is significant.

3. Carpenter, R. C.: Heating and Ventilating of Buildings, New York, John Wiley & Sons, 1915.

1. Drinker, C. K., and Drinker, Katherine B.: The Bone Marrow as a Source of Prothrombin, Am. Jour. Physiol., 1916, xli, 5.

The Appeal of the Mysterious.—Ignorance is guided by terror, rather than by love. To the undisciplined mind, whatever is supernatural or unexpected makes a stronger appeal than the familiar phenomena of daily life.—R. M. Lawrence, Primitive Psychotherapy and Quackery.

Current Comment

GOITER AMONG THE UNITED STATES INDIANS

Simple goiter occurs not only as a sporadic disease in all parts of the world, but also as an endemic manifestation in certain regions. For Europe these goiter districts have long been recognized. They are clearly localized in parts of the Swiss and Italian Alps. Silesia and the Black Forest have circumscribed goiter areas. The disease is also endemic in definite regions of France, Spain, England and Asia. In our own country the existence of goiter in comparable endemic form has not been so well established, or at any rate recognized. It has long been known, however, that goiter is unduly prevalent in the region of the Great Lakes. Sometimes the existence of goiter among domestic animals calls attention first to the similar tendency in man in the same region. This has lately been the case in some of the valleys of northern Montana. The intensive investigation of the problems connected with the etiology of endemic goiter[1] might advantageously be prosecuted in this country more vigorously than it has been in the past. America has its own goiter regions. Dr. Hrdlicka[2] of the U. S. National Museum has directed attention to an immediate opportunity for a thorough investigation, by modern means, of the conditions leading to thyroid enlargement. He reports the excessive prevalence of goiter and symptoms of thyroid derangement among the American Indians along that part of the Missouri Valley comprised between the Cannon Ball Creek and Cheyenne River in North and South Dakota. The situation is said to be sufficiently serious to demand speedy steps for relief, and its localization is attested by the fact that in his visits to upward of fifty tribes, Hrdlicka has never found a locality in which the thyroid disease was as prevalent and active, and where conditions for research into its causes were more promising. The incidence of goiter among the United States Indians has been estimated at 3 per thousand population. A report of 61 cases per thousand among the Blackfeet and Two-Kettle bands of the Cheyenne River group was made some years ago. The present equally great or greater prevalence of the disease in certain parts of the Fort Yates territory had not been suspected. Hrdlicka maintains that goiter among Indians is not connected with cretinism, which seems not to occur at all in that race, or with myxedema, and only rarely and moderately with exophthalmos. The clues to its origin seem to be quite as baffling in the Missouri Valley as in Switzerland. Hrdlicka relates certain facts which help to negate some of the older theories of race and region so long held. Disturbance of the thyroid gland among the Indians, he tells us, is not a tribal peculiarity, for other branches of the Sioux away from the river are less affected. There is no evidence that the disease extends for any great distance along the Missouri, or is common among the white persons of the same localities. The water used by the natives is mostly that of the Missouri and its small affluents. The present habits of these Indians are those of fairly civilized Indians in general. They were always hunters and great meat eaters, and are doubtless still more so than agricultural tribes; but this is true of all the Sioux. The country is of the rolling prairie type, the climate rigorous but not oversevere. Malarial infections are infrequent, but tuberculosis and venereal diseases prevail. If these facts afford no clue to the cause of goiter, they may nevertheless promote inquiry.

1. Endemic Goiter, editorial, THE JOURNAL A. M. A., Aug. 12, 1916, p. 514.

2. Hrdlicka, A.: Goiter Among the Indians Along the Missouri, Science, Aug. 11, 1916, p. 203; Physical and Medical Observations Among the Indians of Southwest United States and Northern Mexico, p. 201.

AN INSURANCE MAN ON SOCIAL INSURANCE

At the National Convention of Insurance Commissioners held last week in Richmond, Va., Hon. Rufus M. Potts, superintendent of the Illinois State Insurance Department, and chairman of the Committee on Social Insurance appointed by the convention, discussed social insurance from the standpoint of the insurance expert. Fearing that the designation "social insurance" might produce a hostile attitude on the part of the general public on account of an erroneous association with the Socialist party, Mr. Potts proposes to designate all such plans as "welfare insurance," which he defines as "the use of insurance principles and methods for the purpose of . . . maintaining every citizen of the United States in a state of wellbeing throughout the various misfortunes and emergencies of life that would otherwise destroy his wellbeing and cause destitution and suffering." He called attention to the fact that there is in every country an unnecessary amount of poverty or suffering which is not due to the improvidence or even misconduct of the individual himself, but which is brought about by accident, sickness, premature death of the bread winner, involuntary unemployment, old age or other causes beyond the control of the individual. He estimates that there are annually in the United States about 82,520 deaths from industrial accidents and 208,000 nonfatal industrial accidents, each sufficiently severe to cause more than seven days' loss of time, and that the total number of nonfatal accidents, industrial and nonindustrial, is about 697,000. The number of cases of sickness among working people he estimates at 13,400,000, entailing a total loss of time of 284,750,000 days, or a wage loss of $488,142,852. The number of deaths each year among wage earners between the ages of 15 and 65 he estimates at 608,239, causing approximately 200,000 dependent families left unprovided for annually. Regarding unemployment, there are practically no reliable statistics. Existing society, accident, sickness and life insurance are wholly inadequate, and reach only a small portion of the total population. Universal welfare insurance under the control of the federal government would, in Mr. Potts' opinion, reduce the expense of operation to a negligible minimum, render it feasible for the nation to contribute to welfare insurance, and compel the improvident to make provision for their families and themselves when overtaken by misfortune. The

insurance of all the workers would include such enormous numbers that under the law of average the conduct of the plan would be stable and certain. The increase of production through greater individual and industrial efficiency and the diminished necessity for charitable relief will more than justify the expense involved. Mr. Potts' discussion of the subject is of special interest as coming from an insurance official rather than from a physician, a public health official or a social worker. It is another evidence of the growing interest in social insurance.

FIRE AND ACCIDENT PREVENTION DAY

October 9 has been designated by the National Fire Prevention Association and the National Safety Council as a day on which to recall the need for the conservation of human life and property through prevention of the hazards with which these two associations are concerned. Holocaust after holocaust and the tremendous loss of property through fire have served to focus the attention of specially trained experts on the fire problem: underwriters' laboratories have been established to investigate the development of fire apparatus; engineers have devoted their attention to the elaboration of fireproof materials and sprinkling devices; furniture builders have designed steel and other noncombustible factory and office equipment. But all this has been prompted, in part, at least, by financial interests. The sacrifice of human lives has been a secondary consideration; it should be the first. Loss through fire is not always chiefly a loss of property, as evidenced by the Slocum, Triangle Shirtwaist Company, and Iroquois fires. For this reason the fire problem, especially as it affects public institutions, merits the attention of physicians. Industrial diseases have recently received extended investigation. New industries and new processes have brought with them a train of new diseases. In these investigations, physicians have been the leaders. Of great importance, also, is the prevention of industrial accidents. The problems are not, of course, chiefly medical, but rather problems to be considered by the safety engineer. Physicians are not ordinarily conversant with the construction of boilers, fly-wheels, transmission machinery, elevators or cranes. There are, however, many phases of industrial accident prevention problems in which the physician can aid in securing adequate safeguards. For example, records can be kept of the causes of all industrial accidents with which the physician is associated, and means can be sought to prevent similar occurrences in the future. Physicians may recommend the provision of appropriate goggles for workers who are liable to injury of the eye from foreign bodies. Many accidents are due to fatigue, but long hours are not the only cause; fatigue is as often due to speeding up or to monotony of muscular effort, as to long hours. The physician here should determine what is reasonable human capacity, thus aiding in preventing accidents caused by overtaxing human effort. By the position of influence which many medical men acquire in the community in which they dwell, they are among those citizens whose opinions carry the greatest weight in matters of public policy. As a citizen, therefore, the physician will often have opportunities of assisting in the application of measures for the reduction of accidents. Practically all accidents are preventable. An infinitesimal number — as that of the man, for example, who puts his finger in an electric fan — are of the variety dependent on human mental fallibility. Movements such as those promulgated by the National Fire Prevention Association and the National Safety Council should receive the cooperation and encouragement of physicians, who have always been among the first in movements for the preservation of human life and health.

CHANGES IN BUTTER DURING COLD STORAGE

The causes of rancidity in butter have frequently been investigated by chemists and bacteriologists. Recently the causes for the undesirable flavors sometimes present in cold-storage butter have been sought by dairymen, storage-men and hygienists. It has been generally supposed that rancidity is due to changes taking place in the fats of which butter is principally composed and that the "off-flavors" are merely mild forms of rancidity. After a series of studies on butter which had been prepared under widely varying conditions and stored at 0 F. for varying lengths of time, Dyer[1] concludes that (*a*) the development of undesirable flavors in storage butter is not dependent on an oxidation of the fat itself, but that (*b*) it is attributable to a slow process of oxidation progressing in the nonfatty constituents of the buttermilk, and that (*c*) the extent of this change is directly proportional to the amount of acid present in the cream from which the butter had been prepared. In other words, the buttermilk supplied the substances which decompose during cold storage and this decomposition is proportional to the amount of acid present in the cream before churning. The experiments showed that butter made from sweet cream had a very mild flavor and kept in good condition almost indefinitely in storage, while the butter from high acidity cream had a high flavor but would not keep well. The remedy consists in preventing the cream from ripening too much, i. e., producing too much acid before churning or, if that has occurred, in washing out the buttermilk from the freshly churned butter with fresh water.

1. Dyer, D. C.: Progressive Oxidation of Cold Storage Butter, Jour. Agric. Research, 1916, vi, 927.

Psychology of Race.—Much psychological attention has been devoted to the *primitive races*, and recent ethnological expeditions have not seldom been accompanied by psychologists who carried their various reaction time instruments and attention apparatus to the South Sea Islands. Yet the results indicate a very thorough similarity of all human beings, as far as the most elementary functions are concerned. The popular idea, for instance, that the senses of the savages are sharper than those of civilized men can be disproved by exact experiment. If certain tribes are able to recognize objects at distances at which civilized men do not notice anything, it is essentially through training of the attention for the observation of small signs, a training which is forced on them by the conditions of their life. The true mental differences between the primitive and the civilized peoples appear in the more complex functions.—Münsterberg.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Typhoid Reduction in Birmingham.—Dr. Cecil D. Gaston, health officer of Birmingham, in his report for August shows that 51,122 persons had received inoculation against typhoid fever from the city of Birmingham, and the cases have reduced 411 per cent., as compared with July.

Personal.—W. E. Bingham, Tuscaloosa, has been reappointed a member of the State Pharmaceutical Board.——Dr. Hathaway J. Denman, Birmingham, has been appointed intern at the Fresh Air Camp for Tuberculosis, Montgomery.——Dr. Marvin M. Gould, Mobile, who has been appointed chief surgeon of the hospital at David, Chiriqui Province, Panama, has sailed for Europe to pursue postgraduate studies and will return to his post in Panama in December.——Dr. Isham Kimbell, Auburn, has been commissioned captain in the Medical Corps of the Alabama National Guard.

ILLINOIS

Conference of Charities and Correction.—The Illinois State Conference of Charities and Correction will be held at Alton, October 20 to 22.

Hospital Association to Meet.—The Illinois State Hospitals Medical Association will hold its next meeting, October 26 and 27, at the Peoria State Hospital.

Dispensary Established.—A dispensary for Sangamon County was opened at St. John's Hospital, Springfield, September 12, under the charge of Dr. Jay T. Wood.

Hospital Opened.—The new hospital located at Paris was formally opened, September 22, and the public inspection occurred on the next day. The institution is under the charge of Dr. Roland Hazen.

Chicago

Additional Appropriation for Poliomyelitis Asked.—The health commissioner has asked for an additional $10,000, to be used to combat infantile paralysis. There had already been appropriated $8,000 for this purpose from the mayor's contingent fund.

The Study of Typhoid Fever.—Messrs. Isham Randolph, Lyman E. Cooley and Langon Pearse, representing the sanitary district; Cicero D. Hill, representing the board of local improvements; W. A. Nelson and W. R. Matthews of the bureau of sewers; and Chief Engineer Frank W. Sadler of the Sixty-Eighth Street pumping station have been appointed, by the health committee of the city council, a commission to study sewer and water conditions in the district between Forty-Fifth and Eighty-Seventh Streets. One of the duties of the commission will be to fix the responsibility for the conditions which caused the typhoid epidemic in this district last year.

Personal.—Prof. A. J. Carlson of the University of Chicago lectured in Toronto before the Academy of Medicine, October 3, on "Some Recent Studies of the Physiology and Pathology of the Stomach."——Dr. John Clarence Webster, who underwent an operation for gallstones in the Royal Victoria Hospital at Montreal, September 27, is improving.——Drs. Gilbert M. Loewe and Harry Mortimer Richter, who have been serving in a hospital at Naumberg-am-Salle, arrived in New York from Germany, September 30.——Drs. Christian B. Luginbuhl and Franz H. Harms have been appointed by the state department to work under the direction of the American Ambassador at Berlin for the relief of British prisoners of war in Germany.

INDIANA

Infantile Paralysis.—Fifteen cases of infantile paralysis have been reported to the Indianapolis Board of Health during the year.——The two schools that had been closed on account of the disease will be reopened, as it is believed that the situation is under control.

Conference on Mental Defectives.—The Indiana State Conference on Mental Defectives will be held at the Hotel Claypool, Indianapolis, October 16 and 17. The object of this conference is to discuss the methods of reducing, if possible, the number of feebleminded, insane and epileptic persons in the state.

Personal.—Dr. Charles J. Rothschild, Fort Wayne, announces his candidacy for coroner on the Republican ticket.——Dr. Halsted S. Murat has resigned as chief physician at the Indiana Reformitory, Jeffersonville, and will move to Middletown, Ohio.——Dr. Giles E. Mowrer has been appointed physician to the Indiana Reformitory, Jeffersonville.

Changes in Medical Corps.—Capt. Archibald G. Chittick, Frankfort, commanding Ambulance Company No. 1, Indiana N. G., has been promoted to major, M. C.——Lieut. Donald C. McClelland, Lafayette, assigned to the Ambulance Corps, has been promoted to captain.——Maj. Frank W. Foxworthy, M. C., Indianapolis, has resigned.——Drs. Melville Ross, Bloomington, and Claude D. Greene, Spencer, have been commissioned first lieutenants, M. C., and assigned to the Ambulance Company.

The Typhoid Situation.—The typhoid situation in Indianapolis is very much improved. Only four or five cases are being reported each day at present. Since August 1, 611 cases have been reported, with thirty-two deaths. Practically all the schoolchildren of the city have been vaccinated, and the city board of health has arranged to inoculate free of charge those who are unable to pay. Judge Ewbank of the circuit court refused to grant a temporary injunction against the board of school commissioners, commanding the board to admit all the schoolchildren who had not been vaccinated. In his decision, he pointed out that the Supreme Court of Indiana has twice decided that orders of local boards of health requiring all children to be vaccinated in times of epidemics were not unconstitutional.

State Association Meeting.—At the annual meeting of the Indiana State Medical Association, held in Fort Wayne, September 27 to 29, the following officers were elected: president, Dr. John H. Oliver, Indianapolis; vice presidents, Drs. John W. Phares, Evansville; Charles M. Mix, Muncie, and George L. Guthrie, Indianapolis; secretary-treasurer, Dr. Charles N. Combs, Terre Haute (reelected); delegates to the American Medical Association, Drs. Charles H. Good, Huntington, and Miles F. Porter, Jr., Fort Wayne (reelected); alternates, Drs. Charles A. White, Danville, and Anexamander M. Hyden, Evansville, and councilors for their respective districts, Drs. Joseph D. Heitger, Bedford; Frederick A. Tucker, Noblesville, and Oliver J. Gronendyke, Newcastle. The report of the legislative committee recommending a full time health officer for each county in the state, and the establishment of a department of child hygiene in connection with the state board of health, was adopted. Evansville was selected as the next place of meeting.

KANSAS

Personal.—Dr. Oscar L. Peak, Springfield, Mo., has assumed his new duties as national medical director of the Knights and Ladies of Security, with headquarters at Topeka.——Dr. Newton A. Seehorn has been appointed physician of the State Reformitory, Hutchinson, succeeding Dr. Fred A. Forney, resigned.——Dr. William R. Dillingham, for four years on the staff of the Halstead Hospital, has resigned and has been succeeded by Dr. Victor E. Chesky, Nickerson.——Dr. Eva Harding, Topeka, was nominated for Congress on the Democratic ticket at the recent primary election.——Dr. Charles A. Dudley has been appointed health officer of Pittsburg, succeeding Dr. Charles F. Montee.——Dr. Edward M. Miers, Salina, has been appointed chief surgeon of the Salina-Northern Railway.——Dr. Walter C. Palmer, Hiawatha, has returned after three months in a field hospital on the western war front.

MARYLAND

Census of Babies.—Dr. Frederic V. Beitler, chief of the bureau of vital statistics of the state department of health, has arranged with the police board for a census of all children born in the city since January 1. The census will be made in connection with the school census, which will be started in November. From the standpoint of the department, the value of the census will be that it will provide a check against the regular reports of births, which physicians and midwives are required by law to make to the health department.

Personal.—Dr. William H. Welch, Baltimore, professor of pathology at the Johns Hopkins Hospital University, has

returned from Europe, where he went early in the summer to make an inspection of some of the most noted European hospitals in order to secure data for the new school of hygiene and public health to be established at the Johns Hopkins University. While in Europe he also secured a great deal of information which will be valuable in organizing and mobilizing the scientific resources of this country. He secured this information in his capacity as president of the National Academy of Sciences and at the request of the president. While abroad, Dr. Welch spent some time with Sir William Osler at Oxford and also visited Dr. Joseph A. Blake at his hospital at Risorangis and Dr. Alexis Carrel, New York, at Compeigne.

Plans for Children's Hospital School.—Plans for the final complete development of the Children's Hospital School that will make it one of the finest institutions in the state have been decided on and are now being worked out by architects to be available when occasion offers in the future. The school is now being used by the city for the treatment of infantile paralysis, and it will not be until after it has been turned back to its owners that the work of construction will begin. Even then only one of the buildings designed will be erected, but the authorities of the institution have had a complete set of harmonious plans drawn, so that as the school grows, the best possible use can be made of any legacies or endowments that may fall to it. The first building to be put up is to be the isolation observation ward. Later, as funds make the work possible, two private wards, a medical and a surgical building will be added in the order named. The buildings, thirteen in all, will probably not be completed for some years, but if an opportunity should come, the institution will be in position to avail itself of it.

Plague Renews Its Grip.—During the past week, more infantile paralysis has been reported in the city and state than at any time since the plague made its appearance. Sixty-nine positive cases of poliomyelitis have been reported in the city since September 1, and eighteen have proved fatal. Physicians in the city health department are showing concern over the fifth case of the disease to develop among children at the Tudor Hall apartment house during the week. All children in the apartment are quarantined and will be kept under surveillance for two weeks or more. A child, brought from Maine, and having a Maine State Board of Health certificate, as well as a traveling certificate from the United States Public Health Service physicians in New York, developed the disease shortly after arriving at a hotel at Denmore Park and the health department has the hotel and family under strict quarantine. Dr. John D. Blake, health commissioner, states the plague is not spreading, and the rule regulating gatherings of children in public places has kept the epidemic from assuming more alarming proportions. However, his request to the board of estimates to retain the thirteen extra physicians and two detectives for at least two weeks longer has been granted.

NEW YORK

Paratyphoid at Camp Whitman.—There are a few cases of paratyphoid fever among the five organizations of state troops at Camp Whitman, Greenhaven. These cases have been confined entirely to members of the Fourteenth Infantry.

Special Study Course for Health Officers.—About twenty-five health officers, chiefly from central New York, began a special course of study at Syracuse University, September 10. The course was outlined by Dr. Frederick W. Sears, Syracuse, district sanitary supervisor, and approved by the state health council. The course is designed better to prepare all student health officers for the performance of their duties in their respective communities.

Personal.—Dr. Amos O. Squire has resigned as prison physician at the State Prison, Ossining.——Dr. Richard H. Hutchings, medical superintendent of the St. Lawrence State Hospital, Ogdensburg, has been given an indefinite leave of absence and will undertake a comprehensive study with reference to the conservation of mental health in his native state, Georgia.——Dr. Charles W. Pilgrim, Poughkeepsie, superintendent of the Hudson River State Hospital, was appointed president of the State Lunacy Commission, September 13.

Academy of Medicine for Long Island.—Plans are being formed by Brooklyn physicians for a new organization to be called the Long Island Academy of Medicine, whose membership will include the profession of the entire island. The project involves the establishment of a great medical library to be kept in a library building which will cost $250,000. At present the library of the Kings County Medical Society comprises 65,000 volumes and it is proposed to add to this several other medical libraries in Brooklyn. Dr. Burton Harris, Brooklyn, is chairman of the committee which has this matter in hand.

New York City

Typhoid Carriers Discovered.—The Department of Health of Brooklyn has discovered thirty-five carriers of typhoid fever, most of whom are adults.

Appropriation for Braces.—The board of aldermen adopted a resolution, September 12, appropriating $50,000 for the purchase of braces and after-care of children suffering from infantile paralysis. The appropriation will be divided between the Bellevue and Allied hospitals and the Department of Public Charities.

Personal.—Dr. Louis Heitzmann has been appointed professor of pathology and bacteriology at Fordham University School of Medicine.——Dr. Robert W. Lovett, professor of orthopedic surgery in Harvard Medical School, delivered an address before the New York Academy of Medicine, October 5, on "The Management of Poliomyelitis with a View to Minimizing the Ultimate Disability."

For the After-Care of Victims of Poliomyelitis.—The directors of the Day Home and School for Crippled Children have declared their intention to keep their home on City Island, Pelham Bay Park, which is now used only as a summer home, open all winter for the care of as many children crippled by infantile paralysis as their means will permit. They are desirous of securing additional funds for this purpose.

Poliomyelitis.—Up to September 30, 9,029 cases of poliomyelitis had been reported in the city, with 2,286 deaths. The new cases number nineteen, with four deaths. On this day there were reported to be 2,131 cases in the various hospitals.——Surg. Lunsford D. Fricks of the United States Public Health Service, who has been inspecting interstate travel through New York, was recently ordered to Boston to assist the health commissioner of Massachusetts in the fight against infantile paralysis in that state.——Though the public schools were opened, September 25, many thousands of children were absent and the department of education has instructed truancy officers to be lenient in the enforcement of the truancy regulations for a couple of weeks, until parents can feel assured that all danger of contracting poliomyelitis in the schools is past.

Committee on After-Care of Infantile Paralysis.—A committee consisting of orthopedic surgeons and social workers has been formed for the purpose of caring for cases of infantile paralysis, with headquarters at 289 Fourth Avenue. The executive committee is as follows: Dr. Thomas B. Riley of the Brooklyn Bureau of Charities, chairman; Oliver H. Bartine, superintendent of the Hospital for Ruptured and Crippled, vice president; Dr. Henry W. Frauenthal, surgeon-in-chief in the Hospital for Deformities and Joint Diseases; Dr. Walter Truslow, Brooklyn; Dr. Jaques C. Rushmore, Brooklyn; Miss Bessie E. Amermann; Henry C. Wright, deputy commissioner of charities; Mrs. Fanniebelle Curtis, Charles B. Grimshaw, Dr. Samuel Kleinberg, James A. Perkins and Dr. Benjamin P. Farrell. The committee has engaged Miss Miriam T. Sweeney of Boston to teach nurses and masseurs the best methods of treating muscles injured by the disease.

Work of the Burke Foundation.—The report of the first year's work of this new field of social service has just been made public. This institution was founded and endowed by John Masterson Burke and is known as the Winifred Masterson Burke Relief Foundation. The object of the institution is to provide a home for convalescent patients until they shall be able to resume work, and also to prevent sickness and invalidism by providing a short period of rest, appropriate food and freedom from worry and care to those in need of this assistance. The capacity of the institution has been gradually increased during the year until there are now 220 beds. There have been 4,054 patients admitted during the year, and 83,472 days' treatment given. There is also a branch institution for boys and colored persons which has a capacity of fifty beds. Dr. Frederick L. Brush, formerly superintendent of the New York Postgraduate Medical School

and Hospital, is the general medical superintendent. The admission department is at 325 East Fifty-Seventh Street. The work is conducted in cooperation with the various hospitals of the city. A special feature is the care of convalescent cardiac patients and their return to suitable employments.

NORTH CAROLINA

Personal.—Dr. John Thames, formerly assistant superintendent of health of Wilmington, has been elected city health officer of Winston-Salem, and has assumed his official duties. ——Dr. F. Arnold Stovall, Wilmington, has been appointed physician of New Hanover County.——Dr. Joseph Akerman, Wilmington, has been appointed a member of the faculty of the Medical College of Georgia, Augusta, and will be in charge of the hospital maintained in connection with that institution.——Dr. Reuben A. McBrayer, Sanatorium, has been commissioned first lieutenant, M. C., U. S. Army, and assigned to service with troops on the Mexican frontier.

OHIO

Two Years' Residence Required.—The Ohio State Medical Board has adopted a resolution requiring that all physicians who seek to register in that state through reciprocity must have resided and practiced at least two years in the state in which they hold their certificate. Several states require this.

Limited Practitioners' Qualifications.—An analysis published recently of the preliminary education of 150 drugless practitioners licensed in Ohio recently under the Platt-Ellis law shows that 121, or 80.7 per cent., had less than a four-year high school education and that for 39, or 26 per cent., there was no evidence whatever of preliminary education.

New Entrance Requirements.—The Ohio State University, College of Medicine, announces that beginning in September, 1917, its entrance requirements will be increased to include as a minimum the sixty semester hours of premedical work as required for the science-medical course. The Bachelor of Science degree will be conferred on completion of the second year in medicine and the degree of Doctor of Medicine at the end of the fourth year in medicine.

Public Health Federation Reorganization.—Reorganization of the Ohio Public Health Federation was effected, September 19, and by acceptance into membership of the Ohio Hospital Association and Ohio Association of Graduate Nurses, the membership of the federation was raised to 11,000. Plans were completed for the establishment of state headquarters in Columbus, to be in charge of G. V. Sheridan, executive secretary of the Ohio State Medical Association, who was elected secretary of the reorganized federation. The executive council consists of Drs. Willard B. Carpenter, Homer C. Brown, D.D.S., Robert G. Patterson, Prof. Edward Spease, and Drs. John H. J. Upham, Frederick O. Williams, and David White.

Personal.—Dr. Joseph S. Garwood, North Lewisburg, is reported to be critically ill at the Champaign County Hospital.——Dr. John R. McDowell, Zanesville, has been appointed chief of the Division of Public Education and Tuberculosis of the state board of health.——Dr. Charles A. L. Reed, Cincinnati, delivered an address before the Butler County Medical Society at Hamilton, September 27, on "Epilepsy, Its Cause and Treatment."——Dr. Charles H. Quayle, Madison, sustained a fracture of the hip when the automobile in which he was riding collided with a telephone pole, September 18.——Drs. Joseph H. Wilson, Bellefontaine, and Henry E. Beebe, Sidney, sustained painful injuries in an automobile accident near Big Springs, September 12.——Dr. Florus F. Lawrence, Columbus, has been ordered to duty at Fort Sam Houston, Tex.

Physicians and Blackmailers.—Probably no class of professional men are so constantly exposed to the danger of blackmailing as are physicians. Not only is the work of a physician necessarily of such a nature as to make him particularly open to such attacks, but the professional reputation of a physician more than any other class of professional men except possibly the ministry is more easily and completely destroyed by such charges, whether substantiated or not. The number of physicians who are victimized each year can only be guessed at. Associated Press dispatches from Cincinnati state that an attempt to blackmail Dr. Charles A. L. Reed of that city resulted in the exposure and arrest of the alleged blackmailer. Evidence was secured through the use of dictaphones and concealed detectives. The woman is under arrest and indictment.

Cincinnati

Popular Subscriptions for Resident Physicians.—Safety Director Friedlander approved of the plan of Dr. H. Kennon Dunham to raise by popular subscriptions enough money to employ three resident physicians at the Municipal Tuberculosis Sanatorium at salaries of $2,000, $1,500 and $1,200, respectively.

Personal.—Dr. Carlton H. Andrew of the staff of the Cincinnati General Hospital has been appointed assistant superintendent of the State Hospital for the Criminal Insane, Lima.——Dr. Earl A. Martin, assistant receiving physician at the Municipal Tuberculosis Association, has resigned to enter the United States Public Health Service.

PENNSYLVANIA

Personal.—Dr. George J. Van Vechten has been appointed director of the department of health of Scranton.——Dr. D. Duer Reynolds, resident physician at the Bryn Mawr Hospital, has been placed in charge of a hospital for infantile paralysis near Bryn Mawr.

State Genito-Urinary Clinic.—The state health department has announced the establishment of a state genito-urinary dispensary at 1630 Poplar Street. This will be conducted for the benefit of the poor and needy afflicted with genito-urinary diseases. The idea of its establishment by the state health department is to relieve the physician of the care of the many deserving but impecunious poor suffering with genito-urinary infections; the prompt attention and proper treatment for such conditions where it might be otherwise necessarily neglected and, thereby, in the rapid elimination of the danger of contagion, to employ the most effective method for the reduction of venereal disease throughout the state. Dr. John L. Laird will be in charge of the dispensary.

Philadelphia

Quarantine Being Lifted.—Dr. Wilmer Krusen, director of the department of health and charities, officially sent notice, September 26, to pastors and superintendents of Sunday schools that the quarantine on churches were lifted, October 1. Schools were opened, October 2, and on October 7, children under 16 years of age will be permitted to attend motion picture theaters.

Personal.—Dr. Leon Brinkmann has been appointed visiting surgeon to the Jewish Hospital.——Dr. Melvin M. Franklin has been made consulting surgeon to the same institution.——Dr. Ardrey W. Downs, formerly professor of physiology at the Medico-Chirurgical College, has accepted a position as head of the department of physiology at McGill University, Montreal.——Lieuts. Joseph V. Klauder and John B. Ludy, M. R. C., U. S. Army, have been placed on the active list and assigned to duty in the Hawaiian Department.——Dr. J. Chalmers DaCosta has been appointed chief consulting surgeon of the Philadelphia General Hospital, succeeding the late Dr. J. William White.——Dr. Ross V. Patterson, recently appointed dean of the Jefferson Medical College, to succeed Dr. James W. Holland, asumed his new office, September 25.——Dr. R. Tait McKenzie, physical director of the University of Pennsylvania, who has been in England all summer serving as a major in the Medical Corps of the British army, arrived in New York, September 24.——Dr. S. Lewis Ziegler has been elected a member of the board of trustees of Bucknell University.

Infantile Paralysis.—September 27, Mrs. E. T. Stotesbury made the first contribution for the care of infantile paralysis convalescents by the Home Relief Division of the Emergency Aid. The amount was $1,000 and contributions received up to September 20 have reached $12,338.53. This money will be used for the maintenance of the County Branch of the Children's Hospital at Wynnefield, in which children of the poor recovering from infantile paralysis are receiving treatment.——It was announced, September 26, by Dr. Wilmer Krusen, director of the department of health and charities, that a city committee on the after-care of infantile paralysis cases would be organized. The Home Relief Division of the Emergency Aid of Pennsylvania has been asked to appoint the committee whose work will be the systemic care of all cases of infantile paralysis which have passed the acute stage. The committee will obtain the cooperation of social service agencies for the purpose of ascertaining the ability or lack of ability for the families to bear the financial burden of the treatment. Through the public, the Home Relief Division has already promised to finance the orthopedic departments of several of the hospitals while they are taking care of infantile paralysis cases.

VIRGINIA

Professional Building for Richmond.—A professional building is being erected in Richmond. It is located at the corner of Fifth and Franklin streets, will be seven stories in height and will be devoted exclusively to physicians, dentists and allied professions. The professional building corporation has been chartered, with the following officers: president, Dr. Lawrence T. Price; vice president, Dr. J. McCaw Tompkins, and secretary-treasurer, Mr. A. R. Holderby. The building will cost about $175,000.

Personal.—Dr. Lucien Lofton has been appointed a district physician of Richmond, succeeding the late Dr. James F. Crane.——Dr. Robert C. Bryan, Richmond, who has been on duty with the American Ambulance in Paris for several months, has returned.——Dr. James W. Reed, Ocean View, has succeeded Dr. William P. McDowell as a member of the Norfolk County Board of Health.——Dr. Henry S. Stern has been appointed medical examiner of the Department of Health of Richmond, succeeding Dr. Bronson E. Summers, resigned.——Dr. J. Raymond Gorman, formerly of Richmond, has been appointed superintendent of the Locus Valley Emergency Hospital, L. I., N. Y.——Dr. William F. Drewry, Petersburg, has been appointed a member of the state board of health, succeeding the late Dr. Otho C. Wright, Jarratt.

WASHINGTON

Personal.—Dr. Frederick W. Rinkenberger, Tacoma, sailed from New York, September 14, to take a position in the German Field Hospital at Deutsch-Eylau, West Prussia.——Drs. John M. Semple, Spokane, and Park Weed Willis, Seattle, have been appointed members of the advisory board on medical education of the University of Washington.

Antituberculosis Association Meets.—At the annual meeting of the Washington Society for the Prevention and Relief of Tuberculosis, held in Everett recently, the following officers were elected: president, Dr. Christen Quevli, Tacoma; vice presidents, Drs. Wilson R. Johnston, Spokane, and Clarence A. Smith, Seattle; secretary, Prof. John Weinziri, Seattle, and treasurer, Mr. J. V. A. Smith, Seattle.

WEST VIRGINIA

Sanatorium to be Reopened.—Directors of the Ohio County Antituberculosis League held a meeting at Wheeling, September 15, and decided that on the appropriation of $8,000, made by the county for the support of the institution, the sanatorium would be reopened and permanently maintained.

Personal.—Dr. John N. Simpson, dean of the University College of Medicine, Charleston, has been made director of the chemical laboratory.——A. G. Cook, Morgantown, has been appointed, by the state health council, state chemist and assistant bacteriologist, succeeding Prof. O. Oughsoorn, resigned.

WISCONSIN

Personal.—Dr. Charles M. Gould, health commissioner of Superior, has been granted a three months' leave of absence on account of ill health.——Dr. George D. Whiteside, Plover, announces his candidacy for the General Assembly.

Sterilization by Law.—Sterilization operations have been performed on thirty inmates of the State Home for Feebleminded, Chippewa Falls, by Dr. Alfred W. Wilmarth, head of that institution, under the direction of the state board of control and in accordance with the law passed by the legislature in 1913, providing for such operations.

Hospital Notes.—The new Milwaukee Infants' Hospital was formally opened, September 7. The building has been erected at a cost of $50,000, and is a two-story fresh air building, each floor being divided into two units.——The Plymouth Hospital and Training School has been incorporated without capital stock. Its object is the care of sick and needy of Sheboygan County.

Senn Bust Given to Museum.—A bronze bust of Dr. Nicholas Senn was presented to the Wisconsin Historical Museum, Madison, by Dr. Emanuel J. Senn of Chicago. Among other gifts recently presented to the museum by the Senn family are the favorite scalpel of Dr. Senn and surgical instruments used by him when he began his practice as a country practitioner near Fond du Lac in 1869.

CANADA

Infantile Paralysis.—Infantile paralysis is spreading in Ontario, and the provincial health authorities are taking steps for a more vigorous handling of the situation. It will probably be found necessary to close the picture theaters and schools to all children under 14 years of age. During September there have been forty-nine cases, with five deaths. In August there were forty-four cases, with five deaths. July had a record of twenty cases, with three deaths. There was one case of a man 50 years of age. The cases occur pretty generally throughout the province.

Personal.—Mr. Irving Heward Cameron, professor of surgery in the University of Toronto, has arrived home in Toronto after a year's service as head of the surgical wards of the Ontario Military Hospital, Orpington, Kent County, England.——Dr. John J. Mackenzie, professor of pathology in the University of Toronto, has returned from Saloniki, where he has been working with the University of Toronto Base Hospital.——Dr. Roland W. Young, Oshawa, Ont., who was for a time doing hospital work at Malta, is now medical officer on a transport between Alexandria and Saloniki.——Capt. F. B. Bowman, Canadian A. M. C., has been placed in command of No. 2 Canadian Mobile Laboratory, stationed at Folkestone, England.

Medical Societies.—The Hamilton Medical Society began its work for the season early in September, when Dr. Lewellys F. Barker was present from Baltimore and delivered an address.——The Academy of Medicine, Toronto, began its winter session by a dinner in the York Club, tendered the members by the president, Dr. Herbert A. Bruce, who is abroad.——The Medical Society of New Brunswick has elected the following officers: president, Dr. Suther C. Murray, Albert; vice presidents, Drs. George G. Corbet, St. John, and Frederick H. Wetmore, Hampton; treasurer, Dr. William E. Gray, Milltown; recording secretary, Francis J. Hogan, St. John, and corresponding secretary, Albert E. Macaulay, St. John.——The Association of Medical Officers of Health of Nova Scotia at their recent annual meeting elected the following officers: president, Dr. George E. DeWitt, Wolfville; vice presidents, Drs. John J. Cameron, Antigonishe, and Willis B. Moore, Kentville, and secretary, Dr. William H. Hattie, Halifax.

Hospital News.—As the Dominion Hospitals Commission has its system of convalescent hospitals well organized for returned soldiers throughout Canada, it is further understood that there will also be established in the immediate future a chain of hospitals across Canada for surgical treatment as well. At the present time there are said to be from 10,000 to 11,000 Canadian soldiers scattered throughout the hospitals of the United Kingdom. Many of these could be sent to Canada for surgical treatment and so relieve the hospitals abroad for immediate cases. Canada bears all the charges for treatment of her sons in the old land.——Lieut.-Col. Charles W. F. Gorrell has resigned the command of the Duchess of Connaught Hospital in England and his place has been taken by Lieut.-Col. David W. McPherson, Toronto. This leaves a vacancy in the command of the Ontario Military Hospital at Orpington.——Command of the Bramshot Hospital, England, has been given to Col. Roderick C. McLeod of the camp of St. Francis Xavier Unit, which has been increased to the strength of a general hospital.——Lieut.-Col. Herbert A. Bruce, Toronto, who has been abroad making a special inspection of all the Canadian hospitals in England and France, is said to have criticized some of these hospitals rather severely. It is understood Dr. Bruce will not return to Toronto until after the first of the year.——An interesting hospital case is being tried in the courts of New Brunswick. The Moncton (N. B.) Hospital is an incorporated institution and at a meeting held early in the year the management passed a by-law by which all persons who subscribed $1 would be entitled to vote for governors at the annual meeting. The term of three trustees has expired; and taking advantage of the by-law some persons appeared, paid the $1, voted and three new trustees were elected. The validity of the above-cited by-law is now disputed, hence the action in the courts.

GENERAL

Southern Physicians to Meet.—The annual meetings of the Southern Medical Association and the National Association of Railway Surgeons are to be held in Atlanta, Ga., in November. The chairman of the committee of arrangements for the Southern Medical Association is Dr. Stewart R. Roberts, Candler Building, and Dr. Thomas H. Hancock is in charge of the arrangements for the railway surgeons.

National Safety Congress.—The fifth annual safety congress will be held at the Hotel Statler, Detroit, October 17 to 20, inclusive. At this meeting the latest developments of acci-

dent prevention and health conservation and practical problems of many industries will be discussed. Sectional meetings will be held on three afternoons. An interesting commercial exhibit of safety devices will be on view at the Detroit Armory.

Roentgenologists Elect New Officers.—At the annual meeting of the American Roentgen Ray Society, held in Chicago, September 28 to 30, the following officers were elected: president, Dr. Lewis G. Cole, New York; vice presidents, C. S. Blair, Chicago, and Dr. Howard E. Ruggles, San Francisco; secretary, Dr. William H. Stewart, New York; treasurer, Dr. William A. Evans, Detroit, and editor, Dr. James T. Case, Battle Creek, Mich.

Obstetricians Hold Meeting.—The twenty-ninth annual convention of the American Association of Obstetricians and Gynecologists was held in Indianapolis, September 25 to 27, and the following officers were elected: president, Dr. John W. Keefe, Providence, R. I.; vice presidents, Drs. Thomas Reder, St. Louis, and Charles L. Ill, Newark, N. J.; secretary, Dr. E. Gustav Zinke, Cincinnati (reelected), and treasurer, Dr. Herman E. Hayd, Buffalo.

New Medical Fraternity Officers.—At the annual meeting of the National Chapter of Phi Rho Sigma Fraternity held in Ann Arbor, Mich., September 22, Dr. Clifford G. Grulee, Chicago, was elected president; Dr. C. Guy Lane, Woburn, Mass., vice president and editor of the Phi Rho Sigma *Journal;* Dr. F. E. Lacy, Chicago, secretary; Dr. William M. Joyce, Chicago, treasurer, and Dr. Charles S. Wilson, Tacoma, Wash., recorder. The next meeting will be held in Philadelphia.

New Officers for Missouri Valley Society.—At the annual meeting of the Medical Society of the Missouri Valley, held in Omaha, September 21 and 22, the following officers were elected: president, Dr. Charles R. Woodson, St. Joseph, Mo.; vice presidents, Drs. E. Winnett Rowe, Lincoln, and Carl B. Hickenlooper, Winterset, Iowa; secretary, Dr. Charles Wood Fassett, Kansas City, Mo. (reelected), and treasurer, Dr. Oliver C. Gebhart, St. Joseph, Mo. (reelected). Keokuk was selected as the next place of meeting.

Prevention of Infant Mortality.—The seventh annual session of the American Association for the Study and Prevention of Infant Mortality will be held in Milwaukee, Wis., October 19 to 21. The subjects that will be discussed at the conference include the work of government authorities for the control and prevention of infantile paralysis during the epidemics of the current years; measles and whooping cough as factors in infant mortality; care available for mothers and babies in rural communities; problems of prenatal care; ways and means of educating the public in the campaign for the prevention of infant mortality; public school education in high schools, and vocational schools, colleges and university extension work, for the prevention of infant mortality.

Hospital Officers Meet.—The eighteenth annual meeting of the American Hospital Association was held at the Bellevue-Stratford, Philadelphia, September 26 to 29, and the following officers were elected: president, Dr. Robert J. Wilson, New York; vice presidents, Dr. Andrew R. Warner, Cleveland, and Miss Georgia M. Nevins, Washington, D. C.; secretary, Dr. William H. Walsh, Philadelphia; treasurer, Asa Bacon, Chicago, and trustees, Richard P. Borden, Fall River, Mass.; Dr. Winford H. Smith, Baltimore, and Miss Mary L. Keith, Rochester, N. Y. The plans mapped out for the organization include a nation-wide crusade, thorough remedial legislation against the baby farms, the placing of all hospitals under state or government control or both, and the standardization of hospitals. Cleveland was elected as the next place of meeting.

Bequests and Donations.—The following bequests and donations have recently been announced:

Pennsylvania Society to Protect Children from Cruelty, and St. Vincent's Home and Maternity Hospital, Philadelphia, each $5,000; St. Joseph's and St. Agnes' hospitals, Philadelphia, each $1,000, by the will of Mrs. Carolina Earl White.

Newport (R. I.) Hospital, for needed improvements in the buildings, a donation of $10,000 from Mrs. Harry Payne Whitney; $5,000 donation from Mr. and Mrs. Vincent Astor.

To build an emergency hospital at Naragansett, R. I., a donation of $50,000, by John H. Hanan.

Children's Hospital, Boston, and Portsmouth (N. H.) Hospital, each $5,000, by the will of Sara F. Turner, Brookline, Mass.

Massillon (Ohio) Hospital, a donation of $50,000, by C. M. Russell.

Samaritan Hospital, Philadelphia, $2,000, by the will of Steven B. Colliday.

Children's Hospital, Philadelphia, an endowment of $100,000, and an additional sum of $10,000, the income of which is to be used for Christmas presents and the annual dinner for patients and attachés of the institution.

Pennsylvania Epileptic Hospital and Colony Farm, $25,000; United Charities of Hazleton, Pa., the income to be used to continue the salary of nurses, $15,000; Philadelphia Hospital and Infirmary for Nervous Diseases, $50,000, by the will of Eckley B. Coxe, Jr.

FOREIGN

Memorial to Robert Koch.—The *Norsk Magazin for Lægevidenskaben* says that the memorial to Robert Koch was recently unveiled at Berlin, six years after his death, with much ceremony. It portrays in antique style the scientist in his working garment. Owing to the war the celebration was exclusively German, G. Gaffky presiding. He was one of Koch's earliest pupils and collaborators.

New Swiss Insurance Law.—Foreign life insurance companies doing business in Switzerland will be affected if a proposed new law is enacted. By the provisions of this law foreign companies writing business in Switzerland will be required to deposit with the National Bank of Switzerland acceptable securities to the full amount of their reserves for Swiss business, and three fourths of this deposit must be in Swiss securities. Swiss companies will be required to cover one half of their premium collections in the same manner.

Inauguration of Institute for Vaccines, Bacteriology and Chemistry at Buenos Aires.—With much ceremony, this new institute was recently inaugurated. Penna, chief of the public health service, Malbran, chief of the bacteriologic service, and various professors with university chairs in these specialties, all delivered addresses. Magnin, chief of the chemical department, reported that already he had researches under way which might aid materially in remedying the scarcity of imported drugs. A number can be made and many are now being made in the workrooms connected with his department. An isolated pavilion has been set apart for a training school in applied chemistry. The national board of health has had a chemical department since 1880, but this new triple institute is said to be equipped for the science and needs of tomorrow as well as today.

Canadian Military Surgeons at Paris.—The medical department of the University of Paris gave a reception recently in honor of the Canadian military surgeons serving in France. They form a branch of the Canadian Association of Military Medical Officers, and are to hold monthly meetings at Paris. The *Presse Médicale* reproduces the addresses at the reception, Landouzy as dean of the university welcoming them, and de Martigny as president of the association responding. Albee of New York was present as an honorary member, and his method of bone plastics was demonstrated by Pariscan, an enthusiast in the method. Landouzy recalled that at the last, the thirteenth annual French medical congress, held in 1913, it was decided to hold the next at Brussels and one after that at Montreal. The war has postponed all the meetings indefinitely.

Inscriptions on Monuments and Memorials to Physicians.—Prof. R. Blanchard of Paris has recently issued the first part of a work on which he has long been engaged as a contribution to the history of medicine. It is a compilation of epitaphs and inscriptions of all kinds on monuments and memorials, temples, statues and busts, and simple inscriptions, relating to members of the profession and biologic sciences. The full title is "Corpus inscriptionum ad medicinam biologiamque spectantium." This first part forms a handsome volume containing 1,258 inscriptions. The *Société française d'histoire de la médecine* wanted to undertake the work, but had no funds for the purpose, and Blanchard has assumed all the expense and, except for a few subscribers, is distributing the work gratuitously to libraries and persons especially interested in the history of medicine. He appeals to such the world around to collect material for the next part. He pleads for cooperation from members of the profession, urging them to send him a copy of all such inscriptions of historical value in their vicinity, reproducing the exact words, punctuation, alignment, capital letters, with brief description of monument, etc., and photograph of it when possible. The name of the compiler is published with each inscription. Address Prof. Raphael Blanchard, 226 Boul. St. Germain, Paris.

Deaths in the Profession Abroad.—E. Nuñez, assistant professor of gynecology and surgical pathology at the University of Havana, and secretary of the national board of health, aged 44. To his initiative is due much of the progress realized in public health matters throughout Cuba in the last few years, especially in better provisions for young children. He was long on the editorial staff of the *Revista de Medicina y Cirugia* and founded the *Prensa Medica* in 1910.——Our Norwegian exchange reports the death of Paul von

Bruns, the noted German surgeon, who followed his father as professor of surgery at the University of Tübingen. Surgery of the extremities was perhaps the field in which he was most interested, but he has done important work in surgery of the larynx and thyroid and in war surgery. His name has been carried far and wide by his *Beiträge zur klinischen Chirurgie*, which he founded in 1883 and has published since. Its approaching hundredth volume had been bespoken by his pupils to be a *Festschrift* in honor of his seventieth birthday, July 2. He also, with Bergmann and Mikulicz, published the "Handbuch der Chirurgie" and continued Bergmann's "Deutsche Chirurgie."——From the same source we learn of the death of H. Chiari, professor of pathologic anatomy at the University of Strasburg. He was the son of the Vienna gynecologist, J. B. Chiari, and was connected with the University at Prague until 1906.——E. Lang, the well known professor of dermatology and syphilis at the University of Vienna, aged 75.——G. Matti, chief of the medical service of the National Guard in Argentina, president of the Touring Club Argentina, at one time inspector general of pharmacies, and formerly collaborator on the *Semana Medica* of Buenos Aires.——N. Reynal, the dean of the profession in Argentina, aged 80. He founded the Buenos Aires Medical Society, and one of his sons, now deceased, is said by our Argentine exchanges to have been the inventor of the tracheotomy cannula.——W. Stewart, at his home in Urchin, Paraguay, aged 86. Educated in London, Perth and Edinburgh, he served as a surgeon during the Crimean War, and ten years later was surgeon-general to the Paraguayan army. In the interval he had been private secretary to President Carlos Lupez. In 1869 he returned to Edinburgh and studied there the antiseptic technic under Lister, introducing it on his return to Paraguay at Asuncion, which was, he thinks, the second place in the world to adopt Listerism. Dr. Stewart was for many years British consul in Paraguay.

PARIS LETTER

Paris, Sept. 7, 1916.

The War

BACTERIOLOGIC CONTROL AND THE SUTURE OF WAR WOUNDS

Bacteriologic control of the course of war wounds consists in regular determination of the microbic content of the exudate. For this purpose, a microscopic count is made of the microbes in a smear, the examination being repeated every two days. Dr. Depage of Brussels has carried out this control systematically in a hospital at La Panne since June 1, 1916. As a result of his examination of 500 cases, Depage is of the opinion that the bacterial control permits of following the evolution of an infection and indicating the precise moment at which suture may be attempted with the best chance of success. There are three periods in an infection of the wound: (1) a period of acute infection, during which microbes are numerous and have a maximum virulence. Suture performed at this stage will inevitably be followed by failure, if not by worse. (2) A period of attenuated infection during which the microbes are fewer in number and less virulent. Suture at this stage will rarely succeed; ordinarily, a part gives way and there is a possibility of reviving the microbic virulence and favoring the return of acute infection. (3) An aseptic period at which suture has every chance of success. It is, however, prudent to wait until two or three examinations have given negative results before practicing suture. Where there are bony lesions and especially fractures, this delay must be still further prolonged. Depage and his collaborators have, since June 1, practiced 137 secondary sutures in 108 cases; each of these cases having previously been subjected to bacteriologic control. A certain number had been sutured before the third or aseptic stage had been completely established. In no case did any complications arise to retard the healing of the 137 sutures, 112 being entirely successful, 23 partially successful and 2 unsuccessful.

THE EFFECT OF DAKIN'S FLUID ON FRESH WOUNDS

At one of the last sittings of the Société de chirurgie de Paris, Dr. Pierre Delbet, professor of clinical surgery at the Faculté de médecine de Paris, communicated the results of researches on the action of Dakin's fluid on fresh wounds made by him in a hospital at the front. He had already made observations on the action of hypochlorites on infected wounds and had communicated the results to the society (The Journal, Dec. 11, 1915, p. 2101). He wished to know if this solution would inhibit the growth of bacteria in wounds treated very early. He samples the exudates, and examines them bacteriologically before and after the action of Dakin's fluid. The conditions were favorable, as the wounds were treated a few hours after their infliction. Nevertheless, only two wounds out of nine, in which no bacteria had been discovered before treatment, remained aseptic. The one was not absolutely aseptic, but practically so. The other was under observation for only three days. In the seven cases bacteria appeared in the wound after two or three days of intermittent irrigation with hypochlorite. One wound of the knee required secondary resection on the seventh day; another patient was in an indifferent condition at the end of several days. The remainder progressed well and it was possible in their case to bring together the lips of the wound, two by suture and two by bandages. On the whole the clinical results were poor. In four cases after free resection, a secondary apposition of the lips of the wound was possible, but of two knee wounds, one required secondary resection; one thigh wound did badly. What Dr. Delbet wished to know was whether, in fresh wounds in which it is not possible to detect bacteria, Dakin's solution is capable of inhibiting the growth of the latter. In fact, this has only happened twice in nine aseptic cases. The history of the hypochlorite question appears to Delbet perfectly simple. First, Labarraque's solution, rendered less irritating by modification which deprived it of some of its germicidal power, was held capable of sterilizing wounds; then the Carrel-Dakin communication to the Académie des Sciences and the Tuffier circular in which the expression "free opening" is not even mentioned appeared. In the second phase, the necessity of early and free exposure was proclaimed. This was a confession of failure, for if free exposure is necessary, the hypochlorite does not sterilize. In the third period; free exposure and irrigation were no longer considered sufficient. Resection of the whole track of the projectile under general anesthesia was recommended. In this evolution, there is one constant, hypochlorite solution and several variables, namely, different methods and surgical treatment of wounds. The favorable results should not be attributed to the constant but to the variables. It is, moreover, unreasonable to believe that Dakin's fluid has an antiseptic action, for Delbet has shown that in wounds treated as above described, the gauze employed to maintain contact of the "germicide" with the wound is richer in microbes than the exudate itself. This apparent paradox finds its explanation in previous experiments of Delbet, which proved that hypochlorites act on the albumin molecule in such a way as to render it more susceptible to attack by microbes. Delbet has convinced himself that simple mechanical cleaning of the wound, excision of the orifices preferably of the whole surface of fresh wounds, followed by immediate reunion, is capable of producing healing by first intention without the help of any antiseptic.

An Alleged Marvelous Remedy for Burns

I was very much surprised to learn of a so-called miracle which had been obtained, according to the "War Letters of an American Woman," in one of the hospitals in the vicinity of Paris by the use of a pharmaceutical specialty, sold under the name of ambrine [The Journal, Aug. 12, 1916, p. 516 and 535]. In spite of the notoriety of which it is the object the remedy in question has not had as great a vogue as it would have merited if it had really had as marvelous effects as "An American Woman" affirms. It was left to America to herald these marvelous effects—completely unknown in France! So true is it, as the French proverb says, "No one is a prophet in his own country."

LONDON LETTER

London, Sept. 18, 1916.

The War

A MOTOR FIELD OPERATING THEATER

The latest achievement of medical science for the succor of wounded soldiers is a motor field operating theater, which is being presented to the Italian government by the Wounded Allies Relief Committee of this country. The vehicle, which is the first movable operating theater to be constructed, has been designed by a well-known surgeon and prominent politician, Sir William Collins. The huge body is mounted on a 4-ton chassis of 25 horse power. Its outstanding characteristics are completeness and compactness, with a view to use in any weather and in any climate. The entrance for the surgeon and his assistants is from behind the driver's seat, and leads immediately to a small compartment which is devoted solely to the sterilization of water, instruments, and complementary vessels, while storage is provided for dress-

ings, lotions, splints and other surgical adjuncts. At the rear of the compartment, and separated by a sliding door, is the theater itself, which is 9 feet 6 inches long, 6 feet wide, and 6 feet 8 inches high, so that ample space is provided for complete freedom of action on the part of the operator. The only fixed furniture in the theater is a copper sink, over which water and lotion taps have been conveniently placed. The walls have been finished in white enamel, and the flooring is sheet lead. The latter material, although somewhat heavy, has been employed on account of its imperviousness to rust. Light is obtained by means of wire glass from the roof, which opens by simple mechanism for the purpose of ventilation, although lowered sides and electric fans are also provided for the same purpose. The 100 candle power electric lamps have been installed, and a Roentgen-ray outfit will be carried in a separate van. Sir William Collins became convinced of the need of motor field operating theaters when he visited Belgium in 1914. His idea is to bring the hospital to the patient, instead of the patient to the hospital, wherever it is found to be practicable, particularly in abdominal cases, in which the rate of mortality is very high unless immediate attention is given. Again, field theaters will enable the army surgeons to arrest hemorrhage and to anticipate sepsis. Sir Alfred Keogh, director general of the Army Medical Corps, and Sir George Makins, consulting surgeon to the army in the field, have inspected the vehicle, and expressed their appreciation of its value as a means of saving life and minimizing suffering. A request has been made by the Belgium government for a duplicate. The cost is approximately $5,000.

SPHAGNUM MOSS AS A DRESSING

The vast demand for surgical dressings has led to the revival of the use of sphagnum moss, which was suggested long ago but had fallen into disuse. This moss grows abundantly in England and Ireland, and was suggested many years ago as an economical substitute for absorbent cotton. Indeed, Joyce, the historian, says it was used as a dressing for the wounds of battle in Ireland in 1014. It grows so abundantly that the supply is inexhaustible. It has three great advantages over absorbent cotton: cheapness, absorbency, and the fact that its preparation is so simple that it can be carried out entirely by unskilled workers. The moss is much more absorbent than cotton, and will take up about twelve times its weight in water. It absorbs moisture very quickly and evenly, distributing it over the whole surface of the dressing, whereas absorbent cotton will absorb at one point, leading the moisture through at that point, while the rest of the wool may remain dry. The even absorption of the moss is one of its principal virtues, for this means that the patient is saved a good deal of disturbance and manipulation, since the dressings do not require to be changed so frequently. The preparation of the moss is simple. After being gathered, it is spread out on the heather or grass near the spot where it grows, and left to dry in the open air and wind. Another plan is to hang it out on a clothes line in open bags made of a very coarse open muslin or sacking, or to spread it out on sheets in gardens or on lawns, so that it is easily carried indoors at night, or during rain. Experiments have been tried of drying the moss artificially, in an oven, or in the drying room of a laundry, but neither plan is very successful, as when it is rapidly dried it becomes very dusty and brittle, and the workers who make it into dressings find it both wasteful and unpleasant to handle. It must be dried slowly, either in the open air, which is by far the best method, or by spreading it out indoors. For use it is put into bags of various sizes made of this muslin. The bags are loosely filled, and should be perfectly flexible and soft, so that they may be bandaged on a limb with comfort, as allowance has to be made for the way in which the moss swells up when brought into contact with moisture. There are four varieties of moss dressings—sterilized, unsterilized, sublimated, or sublimated and compressed. Recent reports show that in many cases the moss is much preferred to absorbent cotton, and every day hospitals are being added to the list of those which already use it regularly. To many of the poorly equipped French hospitals, which can in no way compare with the better provided British hospitals, the moss has proved of the utmost value, when a surgeon has once been persuaded to give it a trial.

HOSPITAL UNIT FROM HARVARD

A fully equipped base hospital unit, consisting of thirty surgeons, two dental surgeons and seventy-five nurses, has left for France in charge of Lieutenant-Colonel Jones of Boston. The hospital is the result of an offer made last November by the Medical Senate of Harvard University to the British government, and its services are to be available until the end of the war. Associated with Harvard in providing the hospital are Yale, Columbia, Princeton, Johns Hopkins and other universities. The movement is due chiefly to the joint efforts of Sir William Osler and Mr. Robert Bacon, formerly United States ambassador at Paris. The Harvard unit will work under the direction of the army medical corps.

Free Distribution of Salvarsan

The Local Government Board has issued a circular to county councils in which are laid down certain rules for the treatment of syphilis under the new scheme (described in a previous letter). The board will supply salvarsan or its approved substitutes free for the purpose of injection, and will give it to all who can produce satisfactory evidence of training or experience in the administration of these drugs. It is recommended that the health officers shall distribute the drugs and satisfy themselves, before issuing a supply, that the applicant is a registered physician with one or other of the following qualifications: that he (1) holds a certificate of having acted as a clinical assistant in a hospital department recognized by the board in connection with a local authority's scheme for the diagnosis and treatment of venereal diseases in their communicable stages; (2) holds a certificate of satisfactory attendance at a course of instruction in the diagnosis and treatment of venereal diseases (including intravenous medication) in such a hospital department or in a recognized medical school or postgraduate college; (3) is or has been within the last five years a member of the permanent staff of a hospital managed by a committee and containing not less than fifty beds, and (4) produces satisfactory evidence other than that indicated that he has had adequate experience in the administration of these drugs by intravenous injection. The scheme is evidently a compromise; as such it is good, better than might have been expected. Probably the appointment of a whole time specialist in each area to whom physicians could send their already notified patients for injection would have been the ideal method. Against this, however, had to be set the reluctance of the patient to face a stranger, and the natural reluctance of the physician to take any course which might savor of breach of confidence.

Marriages

DANA WINSLOW ATCHLEY, M.D., New York, to Miss Mary C. Phister of Chicago and Newbury, Mass., at Newburyport, Mass., September 22.

HARRY CORNELIUS ALBERT BEACH, M.D., Columbus, Ohio, to Miss Marguerite Carolynn Schairer of Zanesville, Ohio, September 7.

ERNEST OTIS MCCLEARY, M.D., Ordway, Colo., to Miss Edna Frances Woodard of Colorado Springs, September 14.

THEODORE FOSTER RIGGS, M.D., Pierre, S. D., to Miss Catherine Cugle of Baltimore at Pierre, September 8.

ARTHUR LEE HAGLER, M.D., to Miss Ottie Morgan Maxey, both of Springfield, Ill., at St. Louis, September 9.

EDWARD PARNELL POWERS, M.D., Roxbury, Boston, to Miss Alice R. Jordan of Brighton, Mass., October 4.

EARL BERTON FITZPATRICK, M.D., to Miss Josephine Irene Murray, both of Martinez, Calif., September 6.

ERNEST LEONARD POSEY, M.D., Van Buren, Ark., to Miss Ethel Smith of Magee, Miss., August 31.

LEO HEULER, M.D., Fellows, Calif., to Miss Hepie Moore of Reynoldsville, Pa., at Chicago, June 15.

BERNARD O. BENDIXEN, M.D., Beechwood, Wis., to Miss Olive Stoupe of Milwaukee, recently.

MELVILLE HAMMOND LONG, M.D., to Miss Ruth Snover, both of San Francisco, September 3.

ROSCOE CONKLING EATON, M.D., to Miss Edna E. Moody, both of Chicago, September 28.

SVERRE OFTEDAL, M.D., to Miss Agnes G. Halland, both of Fargo, N. D., September 13.

JOHN HALL LILLY, M.D., to Miss Mae Connor, both of Philadelphia, September 14.

GIOCHINO LAVIERI, M.D., to Miss Edna C. Gibbs, both of Chicago, September 30.

Deaths

Adoniram Brown Judson, M.D., New York; Jefferson Medical College, 1865; College of Physicians and Surgeons in the City of New York, 1868; aged 79; a Fellow of the American Medical Association and American Academy of Medicine; a member and president in 1891 of the American Orthopedic Association; orthopedic surgeon to the outpatient department of the New York Hospital; appointed assistant surgeon, U. S. Navy, in 1861, and promoted to surgeon in 1866, resigning from the service in 1868; inspector of the New York Board of Health from 1869 to 1877; medical examiner of the New York State Civil Service Commission from 1901 to 1909; author of several treatises on orthopedic surgery and public health; died at his home, September 20.

William Henderson Mayfield, M.D., St. Louis; Washington University, St. Louis, 1883; aged 64; president and surgeon-in-chief of the Mayfield Sanatorium; surgeon to Hormington and Sweet Springs sanatoriums; formerly secretary and executive officer of the American Antituberculosis League; formerly professor of materia medica, therapeutics and diseases of children in the St. Louis College of Physicians and Surgeons; professor of clinical surgery and president of Barnes Medical College in 1911; died in the Mayfield Memorial Hospital, September 12, from cirrhosis of the liver.

Roland Playfair Campbell, M.D., Montreal, Que.; McGill University, Montreal, 1901; aged 40; demonstrator of pathology and bacteriology in his alma mater; chief of the genito-urinary department of the Montreal General Hospital; a member of the American Association of Pathology and Bacteriology; lieutenant-colonel commanding Field Hospital No. 6, Canadian expeditionary force; was killed in France, September 19, by the explosion of a shell which struck the dressing station in which he was attending the wounded.

George V. Calhoun, M.D., Seattle; University of Glasgow, Scotland, 1862; aged 78; in charge of the Marine Hospitals at Port Townsend and Port Angeles from 1866 to 1875; contract surgeon in the army during the Civil War; formerly a member of the territorial senate; president of the board of regents of the University of Washington, first president of the State Board of Medical Examiners, and president of the state board of trade; died at his home, September 16.

William Sherman Connett, M.D., Raton, N. M.; Denver College of Physicians and Surgeons, 1899; aged 51; formerly a member of the New Mexico Medical Society and president of the Colfax County (N. M.) Medical Society; one of the organizers and president of the Raton Supply Company; was instantly killed by the overturning of his automobile near Pueblo, Colo., September 17.

George Hauer Everhart, M.D., Baltimore; University of Maryland, Baltimore, 1890; aged 55; chief surgeon and medical director of the Skin and Cancer Hospital, Baltimore, since its foundation; died at his home, September 17. It was announced at his funeral that the Skin and Cancer Hospital would in the future be known as the Everhart Skin and Cancer Hospital.

Josiah Herbert Keenan, M.D., Elizabeth, N. J.; New York University, New York, 1895; aged 41; formerly a member of the Medical Society of New Jersey; died at his home, September 17, from the effects of a gunshot wound of the head, self-inflicted, it is believed, with suicidal intent, while despondent on account of the death of his wife.

Sanford Hanscom, M.D., Somerville, Mass.; Harvard Medical School, 1868; aged 75; a Fellow of the American Medical Association; a veteran of the Civil War; a member of the Somerville school committee for twenty years and a trustee of the public library for six years; died at his home, September 20, from heart disease.

Delbert Claude Adcock, M.D., Warrensburg, Mo.; University Medical College, Kansas City, Mo., 1904; aged 36; a member of the Missouri State Medical Association and a specialist on diseases of the eye, ear, nose and throat; was found dead in his orchard near Hickman Hill, September 21.

Harlem S. Smith, M.D., Schoolcraft, Mich.; Georgetown University, Washington, D. C., 1867; aged 72; formerly a Fellow of the American Medical Association; a member of the Michigan State Medical Society; died at the home of his daughter in Schoolcraft, September 19, from arteriosclerosis.

John Henry Woodward, M.D., Springfield, Mo.; Eclectic Medical Institute, Cincinnati, 1875; aged 68; died at his home, September 4, from the effects of a gunshot wound of the abdomen, self-inflicted, it is believed, with suicidal intent, while despondent on account of long continued ill health.

Gilbert Tweedie, M.D., Toronto, Ont.; Victoria University, Coburg, Ont., 1860; aged 89; also a clergyman; from 1891 to 1908 medical superintendent of the Toronto Isolation Hospital; died at his home, from the results of a skull fracture sustained in a fall from a street car four months before.

Perry D. Covington, M.D., Bellefontaine, Ohio; Medical College of Ohio, Cincinnati, 1869; aged 73; a Fellow of the American Medical Association and once vice president of the Ohio State Medical Association; a veteran of the Civil War; died at his home, September 15, from angina pectoris.

Thomas Albert Calvin Kephart, M.D., Altoona, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1897; aged 47; a member of the Medical Society of the State of Pennsylvania; while driving his automobile, September 18, was struck by a passenger train and instantly killed.

Frank DeWitt Bates, M.D., Hamilton, Ont.; New York Homeopathic Medical College, New York, 1876; for many years an oculist and aurist of Hamilton, Ont.; died at the City Hospital, Hamilton, August 26, from suppression of urine due to enlarged prostate.

Charles P. Dutchess, M.D., Walton, Ind.; College of Physicians and Surgeons of Indiana, Indianapolis, 1876; a veteran of the Civil War; for forty years a practitioner and druggist of Cass County, Ind.; died at his home, September 19, from disease of the brain.

Floyd Lee Van Wert, M.D., Newcastle, Pa.; University of Pennsylvania, Philadelphia, 1910; aged 32; a member of the Medical Society of the State of Pennsylvania; was killed, September 18, when his automobile was struck by a train.

John Stanley Hanlon, M.D., Los Angeles; Cooper Medical College, San Francisco, 1905; died at his home, September 4, from the effects of a gunshot wound of the head, self-inflicted, it is believed, with suicidal intent.

Thomas B. O'Reilly, M.D., Philadelphia; Medico-Chirurgical College of Philadelphia, 1893; aged 47; one of the best known practitioners of the northeastern section of the city; died at his home, September 18.

John William Was, M.D., Chicago; University of Michigan, Ann Arbor, 1878; aged 61; formerly a member of the Illinois State Medical Society; died at his home, September 23, from carcinoma of the intestine.

Patrick Francis Hogan, M.D., Brooklyn; University of Michigan, Ann Arbor, 1872; aged 65; for several years vaccinator for the Brooklyn Board of Health; died at his home, September 16, from nephritis.

Charles William McClintock, M.D., Ingersoll, Okla.; Central College of Physicians and Surgeons, Indianapolis, 1898; aged 42; died at the home of his aunt in Ingersoll, September 14, from tuberculosis.

Edwin George Sumner, M.D., Mansfield Center, Conn.; Yale University, New Haven, Conn., 1855; aged 86; for two terms a member of the Connecticut Legislature; died at his home, September 13.

Ira H. Fuller, M.D., Columbus, Kan.; Hahnemann Medical College, Chicago, 1884; aged 71; died at his home near Columbus, September 16, from carcinoma of the stomach.

Barney Rubin, M.D., Los Angeles; Kentucky School of Medicine, Louisville, 1893; aged 58; died in the Kansas City Hospital, September 19, after a surgical operation.

James William Harrison, M.D., Spanaway, Wash.; Harvard Medical School, 1868; aged 70; died suddenly from heart disease in North Puyallup, Wash., September 13.

John W. Estes, M.D., Georgetown, Ky.; Cincinnati College of Medicine and Surgery, 1890; aged 68; died at his home, September 11, from cerebral hemorrhage.

Francesco La Spada, M.D., San Jose, Calif.; College of Physicians and Surgeons, Chicago, 1894; aged 52; died at his home, July 2, from bulbar paralysis.

Joseph Samuel Chagnon, M.D., Willimantic, Conn.; Victoria University, Coburg, Ont., 1883; aged 58; died at his home, August 29, from edema of the lungs.

Thomas Wyre Vardon, M.D., Galt, Ont.; University of Victoria College, Coburg, Ont., 1866; aged 74; died at his home, June 30, from heart disease.

Alexander W. Biddle, M.D., Philadelphia; Jefferson Medical College, 1879; aged 65; died at his summer home in Islesboro, Me., September 19.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

HYDRAS

Report of the Council on Pharmacy and Chemistry

Hydras, sold by John Wyeth and Brother, Philadelphia, is one of the many proprietary, so-called "uterine tonics." It is said to contain "Cramp Bark, Helonias Root, Hydrastis, Scutellaria, Dogwood and Aromatics," but as the amounts of the several ingredients are not given the statement regarding its composition is valueless. The label declares the presence of 24 per cent. alcohol.

The name "Hydras," taken in connection with the statement of composition, would suggest that hydrastis (goldenseal) is an important constituent. The report of the Chemical Laboratory of the American Medical Association, however, indicates that hydrastis is present in unimportant amounts:

"The hydrastin content of Hydras was determined by extraction with immiscible solvents (*Pharm. Review*, May, 1908, p. 132). Twenty-five c.c. was found to yield an alkaloidal residue of 0.0160 gm. The preparation contains, therefore, not more than 0.064 gm. 'hydrastin' per 100 c.c. Inasmuch as hydrastis is required to contain about 2.5 per cent. 'hydrastin,' hydras contains an equivalent of not more than 2.56 gm. hydrastis (golden seal) in 100 c.c. and the stated dose of Hydras—one dessertspoonful (8 c.c.)—represents not more than 0.2 gm. or $\frac{1}{10}$ of the U. S. P. average dose of hydrastis."

The label of a recently purchased bottle of Hydras bears the following recommendations for its use:

"Indicated in treatment of Dysmenorrhea, Menorrhagia Anti-Abortive, with anodyne and tonic properties."

"For dysmenorrhea, suppressed menses, etc., a dessertspoonful three times daily, before or after meals."

"To relieve pain due to uterine disorders, a dessertspoonful every three hours, or increased to a tablespoonful, at the discretion of the attending physician."

A circular wrapped around the bottle declares that Hydras is:

"A valuable preparation to the physician in the treatment of dysmenorrhea, colic, cramps, spasm, palpitation incident to pregnancy, and the various pains resulting from diseases of the female sexual organs."

It is further claimed that:

"In the dysmenorrhea of young girls due to some mechanical difficulty, as anteflexion or of a congestive character, of suppressed menses from exposure to cold and other causes of a similar character, Hydras will prove efficient and can be administered freely without danger."

The value of hydrastis in the treatment of the diseases and conditions mentioned is problematical at best, and the small amount present in Hydras is wholly useless. As for the other constituents, cramp bark (*Viburnum opulus*), helonias (false unicorn—*Chamælirium luteum* or *Helonias dioica*) and scutellaria (skullcap—*Scutellaria lateriflora*) are drugs which are practically ignored by most writers on materia medica and therapeutics.[1] Dogwood (*Cornus florida*) is a mildly astringent aromatic bitter for the use of which there is no scientific evidence.[2]

To sum up: Of the five ingredients of Hydras (aside from alcohol and aromatics), one (hydrastis), which apparently gives the preparation its name, is present in unimportant amounts; three (cramp bark, helonias and scutellaria) are therapeutically unimportant; the fifth (dogwood) has never been shown to have any specific action on the uterus. The potent constituent, therefore, appears to be the alcohol.

But, even if every one of the several drugs said to be contained in Hydras were possessed of distinct therapeutic properties, and if each were present in known and therapeutically active amounts, still the combination in fixed proportion would be irrational. No one could foresee the joint effect of the five drugs in the several conditions for which the mixture is advertised. Hydras is evidently meant to appeal to the thoughtless and to be used at random; witness the suggestion made in the advertising that

"Owing to its palatability, it is acceptable to patients with impaired digestion, and will serve as a stomachic tonic, promoting appetite and digestion."

A useless alcoholic nostrum "administered freely" to women and girls is as dangerous as the recommendation for such administration is reprehensible.

This preparation is semisecret. The recommendations for its use in specified diseases which appear on the label and in the advertising accompanying the bottle are sure to lead to its ill-advised use by the public. The claims made for its curative properties are exaggerated and unwarranted. The name, in view of the small content of hydrastis, is misleading. Finally, the combination of five drugs, even if individually they were of therapeutic value, is irrational. Hydras, consequently, is inadmissible to New and Nonofficial Remedies for conflict with Rules 1, 4, 6, 8 and 10, and publication of this report is authorized.

[EDITORIAL COMMENT.—Products like "Hydras" are the bane of scientific medicine. The physician who prescribes them could with just as much reason prescribe any of the various alcoholic "patent medicines" of the "women's tonic" type. In fact, his patients would be running less risk of contracting the alcohol habit if he prescribed the "patent medicines" as these nostrums usually have less alcohol than is contained in their "ethical" prototypes—and alcohol is the only really important drug in practically all of them. Whatever one may think of reputable pharmaceutical houses who put out products of the "Hydras" type, the fault really lies with the profession which tolerates such therapeutic monstrosities.]

1. See reports of the Council, THE JOURNAL, Jan. 9, 1915, p. 165; Jan. 23, 1915, p. 359; Nov. 27, 1909, p. 1836; March 27, 1915, p. 1093.
2. See Reports Council Pharm. and Chem., 1912, p. 36.

Correspondence

Fetus of Abnormal Weight

To the Editor:—I was interested in the report of a child of abnormal weight, by D. P. Belcher, M.D., in THE JOURNAL, Sept. 23, 1916, p. 950, especially as you have added a "comment" detailing several other such cases with credible records. The following case is not for publication particularly, but simply to add to your record of actual cases of overweight, newly born infants.

On Feb. 16, 1914, I delivered a primiparous woman, aged 31 years, and perfectly normal physically, being a little more than the normal height and weight, of a living male child which weighed a very little over 18 pounds twenty-four hours after birth.

The pelvic measurements as I found them before labor were normal, or as I thought at the time, a good generous normal.

The labor was not extended beyond safe limits and she did not work harder apparently than she has since in giving birth to a normal sized child. No instrumentation was at any time felt to be necessary or even expected to be so, as the descent of the head and its rotation went on in the usual way and at about the usual speed.

One or two things attracted my attention during and after the labor: the normal size of the placenta with the small amount of fluid in the membranous sac; the large size of the umbilical cord, the vessels being very tortuous; the marked elasticity of the maternal soft parts, the stretching of which seemed to be almost without limit, so that after labor the perineum was absolutely intact, even to the mucous membranes at the fourchette.

If the data I procured at the time were correct there is no doubt that the pregnancy was at least fourteen days over the normal limit. WILLIS S. COOKE, Otego, N. Y.

Danger to the Infant in Nitrous Oxid Oxygen in Labor

To the Editor:—I am desirous of obtaining statistics covering the United States, so far as possible, relative to the danger to infants from the use of nitrous oxid oxygen gas in labor. I should be glad to have information from any of your readers who have had such complications in their practice.

R. R. Ferguson, M.D., Chicago.
4175 Irving Park Boulevard.

Queries and Minor Notes

Anonymous Communications and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

DAKIN'S SOLUTION—USE OF MAGNESIUM CHLORID

To the Editor:—1. Please give me the formula for Dakin's solution. 2. What is the strength of magnesium chlorid solution used in dressing wounds?

M. I. Yannons, M.D., Electric, N. C.

Answer.—1. In August, 1915, Dr. H. D. Dakin, formerly director of the Herter Laboratories of New York, but now serving as bacteriologist in France, read a paper on antiseptics before the Academy of Sciences at Paris (*Presse méd.*, society proceedings, Aug. 5, 1915. Research in Antiseptics, *Brit. Med. Jour.*, Aug. 14, 1915, p. 261. The So-Called New Antiseptic, editorial, The Journal, Sept. 4, 1915, p. 880). He described the making of a neutral solution of hypochlorous acid—claimed to be less irritating than either a hypochlorite with a caustic cation (as Ca or Na) or an acid solution of hypochlorite—as follows:

Two hundred gm. of chlorinated lime are added to 10 liters of water in which 140 gm. of sodium carbonate (anhydrous) have been dissolved. The mixture is thoroughly shaken, and after half an hour the supernatant liquid is siphoned off of the precipitated calcium carbonate and filtered through cotton. The clear liquid thus obtained is made neutral by adding boric acid solution (containing from 25 to 40 gm. of boric acid) until a drop does not redden with phenolphthalein as an indicator.

This was erroneously called the "Dakin-Carrell new antiseptic." Dakin later disclaimed that it was at all new (Dakin's Disclaimer of Novelty in the "New" Antiseptic, editorial, The Journal, Feb. 5, 1916, p. 430). It may be looked on as simply Labarraque's solution (sodium hypochlorite [NaOCl]) made neutral with boric acid. The prepared solution loses its strength. An important point which seemingly has been overlooked is that the strength of the bleaching powder has not been determined; as is well known, the product is exceedingly variable (A Recent Report on Foods and Drugs, The Journal, Aug. 26, 1916, p. 695).

In the same paper Dakin discussed the action of hypochlorites, believing that they reacted with proteins, forming chloramins (>NCl). Such chloramins are antiseptic. He and others, therefore, proposed a "new antiseptic" (Ibs, H. D.; Cohen, J. B., and Kenyon, J.: Studies in Antiseptics, II, on Chloramine, *Brit. Med. Jour.*, Jan. 29, 1916), sodium paratoluene-sulpho-chloramid ($CH_3C_6H_4SO_2Na:NCl.3H_2O$), which is being investigated in Europe. It is claimed to be less irritating and more stable than a hypochlorite solution, but of about the same antiseptic efficiency. It has been accepted by the Council on Pharmacy and Chemistry for New and Nonofficial Remedies under the name of Chlorazene (The Journal, Sept. 30, 1916, p. 1021).

2. Magnesium chlorid is extremely hygroscopic, and is kept in solid form only with difficulty. We are unable to find any references to its use as a surgical dressing.

VACCINATION AND SMALLPOX IN JAPAN

To the Editor:—I am endeavoring to secure vaccination in the public schools here and, of course, am meeting with the usual amount of opposition from the "antis." They fired their first broadside in the public press last evening in which they advanced the argument that in Japan they enforce a nation-wide compulsory vaccination and have for many years, but that in spite of this, they had in recent years the most serious epidemic of smallpox of any civilized country. Can you give me any data on this argument?

Charles F. Lynch, M.D., Health Officer, Lansing, Mich.

Answer.—The above query was referred to the Japanese Consulate in Chicago. The following reply was received:

To the Editor:—In response to your letter of Sept. 11th, I advise you that vaccination against smallpox is compulsory and enforced all over Japan. The latest regulation for the enforcement of vaccination is the Law No. 35, promulgated on the 14th of April, 1909. The said law was preceded by the Notifications of the Department of the Home Affairs in 1876 and the Decree No. 34 of "*Dajokan*" (the Cabinet) of 1885 which had the same object in view. The present law was passed by the Diet and was duly approved by the Emperor, and is technically stronger and more efficient. The attached statistics will show the practical results of the aforesaid ordinances and present legislation.

The statement that Japan has had "in recent years the most serious epidemic of smallpox" was made, I believe, with the incidents of 1908 in mind. But, according to a reliable information from a Japanese physician who is now staying in this city for medical study, most of those cases are accounted for by an undue confidence on the part of our people of their immunity from the disease caused by scarcity of the epidemic in the preceding years, and their subsequent negligence of vaccination. I think that this information is very well supported by the figures in the attached statistics for the following years which show the result of revived enforcement of vaccination.

S. Kurusu, Consul for Japan, Chicago.

Smallpox in Japan 1885-1914

Year	Number of Cases of Smallpox	Number of Deceased Thereof	Population
1887	39,779	9,967	39,069,691
1888	4,052	853	39,607,234
1889	1,324	328	40,072,020
1890	296	25	40,453,461
1891	3,608	721	40,718,677
1892	33,779	849	41,089,940
1893	41,898	11,852	41,388,313
1894	12,418	3,342	41,813,215
1895	1,289	268	42,270,620
1896	10,704	3,388	42,708,264
1897	41,946	12,276	43,228,863
1898	1,752	362	43,763,855
1899	1,215	245	44,270,395
1900	111	4	44,825,591
1901	92	4	45,446,369
1902	46	7	46,041,768
1903	72	6	46,732,876
1904	1,188	237	47,219,566
1905	278	62	47,678,396
1906	496	109	48,164,761
1907	1,034	437	48,819,630
1908	18,075	5,837	49,588,804
1909	106	26	50,254,471
1910	80	13	50,993,344
1911	202	34	51,733,934
1912	14	1	.....
1913	108	39	.....
1914	485	110	.....

[Comment.—The Japanese "argument" is a favorite one with the antivaccinationists. It has been effectively answered many times, but effective answers are no more convincing to antivaccinationists than they are to antivivisectionists. Kitasato, Director of the Institute for Research in Infectious Diseases of Tokyo, one of the most eminent of living bacteriologists, discussed the subject of "Vaccination and Smallpox in Japan" at length in The Journal for March 25, 1911. The figures quoted by Mr. Kurusu are identical with those given in Kitasato's article, although the former gives the later data. In Japan, as in other countries, the compulsory vaccination law is rigidly enforced only in times of epidemics. In the intervals it is only partially enforced. The epidemics of Japan occurred in '87, '92 and '93, '97 and 1908. During each epidemic, the vaccination laws were enforced and the disease promptly disappeared, as shown by the rapid fall of cases from 39,779 in 1887 to 4,052 in 1888; from 41,898 in 1893 to 1,289 in 1895; from 18,075 in 1908 to 106 in 1909. In the intervals between epidemics in Japan, as in all other countries, the law was not rigidly enforced and the number of unvaccinated persons increased and formed the material on which the next epidemic developed. Instead of furnishing an argument against vaccination, the health reports of Japan since 1885, the year in which the vaccination law was passed, form one of the most substantial arguments in favor of the efficacy of vaccination in the control of smallpox.

The number of cases reported in 1908 is 18,075 out of a population of 49,588,804. This is one twenty-seventh of 1 per

cent., or one case in 2,700 population. The opponents of vaccination refer to this epidemic as "the most serious epidemic of smallpox in any civilized country." Yet in pre-vaccination days, smallpox caused from one tenth to one half of all the deaths.

As usual the antivaccination argument is based on half knowledge and distorted facts.]

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ARKANSAS: Regular, Little Rock, Nov. 14. Sec., Dr. T. J. Stout, Brinkley; Homeopathic, Little Rock, Nov. 13. Sec., Dr. Scott C. Runnels, 900 Scott St., Little Rock; Eclectic, Little Rock, Nov. 14. Sec., Dr. C. E. Laws, 712 Garrison Ave., Fort Smith.

CONNECTICUT: Homeopathic, New Haven, Nov. 14. Sec., Dr. E. C. M. Hall, 82 Grand Ave., New Haven; Eclectic, New Haven, Nov. 14. Sec., Dr. T. S. Hodge, 19 Main St., Torrington.

DISTRICT OF COLUMBIA: Oct. 10-12. Sec., Dr. Edgar P. Copeland, The Rockingham, Washington.

FLORIDA: Homeopathic, Jacksonville, Nov. 10. Sec., Dr. J. B. Griffin, St. Augustine.

GEORGIA: Atlanta, Oct. 10-12. Sec., Dr. C. T. Nolan, Marietta.

ILLINOIS: Chicago, Oct. 10-12. Sec., Dr. C. St. Clair Drake, Springfield.

IOWA: Des Moines, Oct. 17-19. Sec., Dr. Guilford H. Sumner, State House, Des Moines.

KANSAS: Topeka, Oct. 10-12. Sec., Dr. H. A. Dykes, Lebanon.

MAINE: Portland, Nov. 14-15. Sec., Dr. Frank W. Searle, 776 Congress St., Portland.

MASSACHUSETTS: Boston, Nov. 14-16. Sec., Dr. Walter P. Bowers, Room 501, No. 1 Beacon St., Boston.

MICHIGAN: Lansing, Oct. 10-12. Sec., Dr. B. D. Harison, 504 Washington Arcade, Detroit.

MISSISSIPPI: Jackson, Oct. 24-25. Sec., Dr. J. D. Gilleylen, Jackson.

NEVADA: Carson City, Nov. 6. Sec., Dr. S. L. Lee, Carson City.

NEW JERSEY: Trenton, Oct. 17-18. Sec., Dr. Alexander MacAlister, 428 E. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 9. Sec., Dr. W. E. Kaser, East Las Vegas.

OKLAHOMA: Oklahoma City, Oct. 10-11. Sec., Dr. Ralph V. Smith, 502 Daniel Bldg., Tulsa.

SOUTH CAROLINA: Columbia, Nov. 14. Sec., Dr. A. Earle Boozer, 1906 Hampton St., Columbia.

TEXAS: Fort Worth, Nov. 14-16. Sec., Dr. J. S. McCelvey, Temple State Bank Bldg., Temple.

WEST VIRGINIA: Parkersburg, Nov. 14. Sec., Dr. S. L. Jepson, State Health Commissioner, Charleston.

Medical Education in South America

Dr. C. M. Macedo was the delegate from the Academia de Medicina of Peru to the recent Pan-American Congress at Washington, and his report is published in the *Cronica Medica* just received. He says that the political features of the congress overshadowed the scientific, the delegates all feeling that they could serve their country best by taking advantage of the exceptional occasion to cement the bonds of friendship, of *confraternidad Americana.*

MEDICAL SCHOOLS IN SOUTH AMERICA

"Next in interest," he continues, "were the discussions on medical education. They threw into bright relief certain advantages of the systems followed in South America over those in vogue in the United States. Medical schools in Latin America are relatively few, and the fact that they are of a high grade cannot be ascribed solely to the greater efficiency of the state in its intervention in higher education. Among other reasons, the solid and central organization of the medical schools gives them a great influence and unquestioned authority in all that concerns medicine. It places them in exceptional conditions for coming into direct contact with the people, extending their influence into the national life by teaching hygiene, etc. This was one of the ideals emphasized at the Washington congress, and it is already realized by the long established medical school at Lima. The medical faculty at Lima is not only a teaching but also an administrative body, the center and aggregate of valuable forces. It confers its diplomas in the name of the nation, and it places the graduate professional man under the protection of the central government, which is practically sovereign in all that concerns the practice of the medical sciences and pharmacy in Peru. It thus enjoys already what——to judge from the ideas expressed at the Washington congress——best guarantees the legal practice of medicine in a country.

ENTRANCE REQUIREMENTS

"There was practical unanimity of opinion at the congress on the necessity for a solid training in biologic sciences as an indispensable requirement for entrance to the medical school, and on the necessity for addition of a fifth year to the course in those schools which require only four now. The importance given to this theme in the program of the congress conformed to the laudable desire to give greater force to the campaign which the high medical body of the United States has undertaken with the purpose of exalting the prestige of the profession in that country, giving a more scientific character to medical instruction, increasing the years of study, and paying more attention to selecting high grade men than to increase the numbers of graduates.

COMMERCIALISM IN MEDICAL SCHOOLS OF UNITED STATES

"Medical education was unable to hold aloof from the current of commercialism which signaled the progress of that great republic from the middle of the last century. Its medical schools had to adapt themselves to the exigencies of contemporaneous life, and they sacrificed their high scientific aim to utilitarian purposes, endeavoring to give an essentially practical instruction in the shortest possible time, thus running the risk of fostering in students and graduates merely an interest exclusively for diagnosing sickness and treating it. Such a state of education in the medical schools is far from corresponding to the progress of the medical sciences in the United States, which is due to the magnificent work at institutes devoted to medical research, and to the isolated achievements of many men of exalted scientific spirit. The medical schools of Latin America have never reduced their years of study, and have always made every effort to conserve the old system, giving to the instruction a scientific value and to the members of the profession the self devotion of the priest. They already possess a course of instruction which can be adapted to the new tendencies and to the growing impulse of medical progress in these later days.

THE MEDICAL SCHOOL AT LIMA

"It is with great complacency that we can laud the wise foresight of the master minds of our medical school at Lima. Inspired by the old traditions of ample clinical culture, they have always insisted on two years of preparatory studies in the natural sciences and seven years of medical training, during which the student is obliged to visit the hospitals daily. The result of this is that the faculty of medicine of the University of Lima is in a favorable condition to conform to the new orientation of the universities, which is, to transform them into centers of scientific research without detracting from their task of offering thorough instruction in the scientific truths already acquired—teaching to observe and training in experimental work, educating not only clinicians but investigators as well."

INTERCHANGE OF PROFESSORS AND STUDENTS

Macedo remarks that the interchange of students and professors is scarcely possible as yet, owing to the differences between the medical schools in the two Americas. But when they become more of a uniform pattern, the benefits from such interchange, he admits, would be enormous. In conclusion, he expatiates on the work of the institutes for scientific research in the United States, their important contributions to the modern progress of surgery and hygiene and, above all, on the magnificent organization of its medical societies, which, realizing the deficiencies in medical education, have started the profession on the road of scientific progress.

Mutual Responsibility.—No one class of society can dissociate itself from another class, however low in the scale, and say that it has no duties and no responsibilities regarding it. "Men cannot live isolated," says Carlyle; "we are all bound together for mutual good or mutual misery, as living nerves in the same body. No highest man can disunite himself from the lowest."—Ashley, Infant Mortality.

Book Notices

Diseases of the Digestive Tract and Their Treatment. By A. Everett Austin, A.M., M.D. Cloth. Price, $5.50. Pp. 552, with 85 illustrations, including ten color plates. St. Louis: C. V. Mosby Company, 1916.

This book is evidently intended mainly for the student and general practitioner. It is not sufficiently complete to be of great value to the specialist. It contains, however, most of the essential facts of clinical importance relating to the medical diseases of the gastro-intestinal tract. The classification of the subject into the three main divisions of (1) general characteristics, (2) special gastric diseases, and (3) special intestinal diseases, with appropriate subdivisions under each heading, is practical and useful, both for teaching and for ready reference. Most of the illustrations are excellent; some, however, are exaggerated, as, for instance, those of stenosis on pages 76 and 77. Some of the roentgenograms appear to be retouched. This is not a bad fault in a textbook, but it should be noted in the legends. The roentgenograms showing the normal stomach add to the value of the book because direct comparison with illustrations of pathologic conditions is thus made possible. In connection with diagnosis, the strong emphasis on the importance of the history is noteworthy. The value and limitations of gastric analysis are well described. In general, the handling of the difficult subject of dietetics is satisfactory for practical purposes, but 2,025 calories, mentioned on page 226 as the total food value for a diet in malnutrition, seems rather low. On the whole, the drug therapy recommended is simple and rational. There is a noteworthy absence of the complex, unscientific type of prescription. Repeated references are made to many of the useful, official preparations, particularly the artificial mineral waters, such as the effervescent, artificial, Carlsbad and Kissingen National Formulary formulas.

Theoretically, atropin sulphate and magmatis magnesia, N. F., are incompatible as prescribed on page 265. It is probable, however, that the atropin under these conditions will be absorbed. The discussion of the use of alcohol on pages 205 and 206 lacks sufficient emphasis on the point that although alcohol stimulates the secretions of the gastro-intestinal tract, it, at the same time, inhibits the digestive power of the ferments. In a few instances, drugs of doubtful value have been recommended. Semiproprietary combinations are also occasionally mentioned where pharmacopeial preparations are available. To intimate, as on page 94, that it is permissible to shake out of a bottle the required amount of two powders without weighing is dangerous advice to a student, whether the substances are markedly toxic or not. While due weight is given to those conditions that require only medical therapy, the importance of surgery in the rational treatment of diseases of the gastro-intestinal tract is clearly outlined. There are, however, some further minor adverse criticisms. The Ehrlich reaction recommended on page 48 is of little value in the diagnosis of hepatic diseases. A description of amebic dysentery and the emetin treatment is lacking. It is surprising that so important a subject should be omitted. There is a noteworthy lack of references to medical literature. The book is in no sense a complete treatise on the subject, but it is a useful summary.

Embryology, Anatomy and Diseases of the Umbilicus, Together with Diseases of the Urachus. By Thomas Stephen Cullen, Associate Professor of Gynecology in the Johns Hopkins University. Illustrated by Max Brodel. Cloth. Price, $7.50 net. Pp. 680, with 269 illustrations. Philadelphia: W. B. Saunders Company, 1916.

One would scarcely believe that a volume of 680 pages could be written exclusively on the umbilicus; but this work is a demonstration of the possibility. Furthermore, everything contained therein is important and an essential part of a complete treatise on the subject. The embryology and anatomy of the region are first considered; then follows an elaborate presentation of the congenital anomalies and pathologic conditions affecting the part. Not only are the diseases of the umbilicus itself presented, but also all the conditions which may arise from persistent remains of fetal structures, such as the omphalomesenteric duct, the allantois, or urachus, and Meckel's diverticulum. The literature of the world has been searched for illustrative cases, so that no statement is made which is not backed up by actual experience. The illustrations are by Brödel, and this is a guarantee of their excellence. A complete bibliography supplements each chapter. The work is an excellent one and the author is to be congratulated on the very thorough and comprehensive manner in which he has presented the subject. It is a credit not only to him, but also to American medicine.

Miscellany

Drugless Cults in Ohio

The State Medical Board of Ohio is now investigating the more difficult cases of drugless healers who are applying for "limited practice" certificates, under the Platt-Ellis law, on the ground that they were engaged in continuous practice for five years prior to the amendment of the law. According to the *Ohio State Medical Journal* for September the board is having some amusing experiences.

One of these applicants, a Mansfield healer, had applied originally for a license to practice theosophy, but as that was not recognized by the law as a system of healing, he later amended his application to include suggestive and psychotherapy. On the advice of one of the board's investigators, the applicant was summoned to Columbus to explain his practice to the board. He came, very fussy and very important.

"I understand," said President Siemon, after consulting the investigator's report, "that you have been treating infectious and contagious diseases."

"Nothing lately but tuberculosis," the healer replied. He then added, professionally: "I've been getting some very nice results."

Dr. Siemon coughed, and inquired timidly by what system the results were obtained. Here is the exact answer:

"By the power of thought and the grace of God."

Dr. Sherman suggested that he exemplify his explanation a bit, and tell the board just how the same was applied in healing the lungs. Again the answer was very specific and definite:

"God put man on earth to live and do good. Don't do no evil."

He refused to explain further. The board members seemed at a loss as to further questioning, but Dr. Upham asked:

"You say that you treat tuberculosis and other diseases. How do you recognize these conditions?"

The healer turned to him, with a rather fatherly and half pitying look, and answered promptly:

"Why, by seeing them."

Dr. Siemon then ventured an inquiry as to the applicant's use of local applications in the treatment of cancer. The good brother answered promptly:

"Well, I don't use applications no more, much. I used to, occasionally. I had success by putting a little rotten apple on the sore. I—"

He was promptly excused.

At the same meeting of the board a woman applicant for a license to practice "suggestive therapy and mental healing" appeared to argue her case. In answer to a suggestion that she explain her system, she turned impressively to Dr. Siemon and said:

"Yes, doctors, I have taught others to heal the afflicted and I will now teach you."

With a smile, she then explained that it was only necessary to take three red silk threads, knotted carefully, and pass them slowly before the patient, commencing at the top of the head. While doing this you repeat in German a couplet which strongly resembles, "Eenie, meenie, miney, mo." Mix in a strong portion of faith, and the trick is turned. Very simple, and it works in almost any condition. She said that after learning it from her mother she had personally treated tuberculosis, erysipelas, and "lots of other bad diseases." She was excused.

Medicolegal

Not Entitled to Practice Under Present Law—Reasons for Legislation

(Gay vs. State (Tex.), 184 S. W. R. 200)

The Court of Criminal Appeals of Texas affirms a conviction of Defendant Gay of unlawfully practicing medicine. The court says that, because of the law, there was no error in refusing to permit the defendant to testify that he graduated in the State University of Louisiana in the Medical Department, in 1868, and went to Texas and immediately thereafter engaged in the general practice of medicine in its various branches and continued therein from 1868 until the complaint was filed against him herein. No such testimony by him, under the circumstances, would be any defense whatever. Nor did the court err in refusing the testimony of others along the same line. The only authority to practice medicine which he had registered in the district clerk's office of the county was a certified copy from the district clerk of another county, dated Dec. 7, 1914, of what showed on its face was a mere temporary license issued Dec. 8, 1892, by a member of the medical board under the old law as it then existed, and by its own terms was good only until the next regular meeting of the medical board of the district mentioned. Under no circumstances could it be the verification license under the law as it has been since 1907. By Section 15 of the act of 1907, all the old physicians were given a year, but no longer, to get the new verification license from the board created by it, without standing any examination. However, by placing Article 757 of the penal code in the revision, instead of said Section 15, it was intended, and only intended, they should still not be cut off entirely, as Section 15 provided, but given another opportunity to get a verification license by complying with said Article 752, and they still have that opportunity. The defendant not having availed himself of the opportunity within the year after the act of 1907 went into effect, and still not doing so after the law was reenacted in the revision giving him still the opportunity, but practicing contrary to and in face of the law, must suffer the consequences of his own acts.

To protect the lives, and preserve the health of the people is one of the chief objects and duties of government. In order to help to do this, the legislature of the state, since the establishment of the state government, has all along, and from time to time, enacted laws to prevent the incompetent person, the faker and the fraud from deceiving the sick and afflicted under their false claim to "cure all," and from fleecing them of their money, and at the same time fully provide for the proper license of those who prepare themselves by a thorough study and knowledge of the human body, and the diseases and ailments to which it is subject, and thus prepare themselves to properly administer to, and treat the sufferer. One of the best methods heretofore devised to accomplish this, and let all the people know who were competent and authorized, was to require, as a prerequisite to practice, a proper authority duly recorded in the district clerk's office of the county of the residence of the practitioner, which any and every one could see for himself, and that method still prevails. At an early day, a diploma from a reputable medical college, duly so recorded, was required, and perhaps was all that was then required. It was not long till the faker and fraud took advantage of this, and procured and recorded diplomas from medical colleges, which sold diplomas outright to any and every one who paid the price, and without any previous study or preparation. Also, it developed that many young men, for lack of means or other reasons, were unable to attend college and procure a diploma, but who studied at home and under the instruction and assistance of local physicians fully prepared themselves to practice as well as those who attended colleges and procured a diploma. For all such the legislature provided medical examining boards, where such young men could stand examinations and procure a license to practice without any diploma. In the course of time, another class had grown up, which consisted of those worthy and competent practitioners who, without license or diploma, by many years of study and practice, had demonstrated their competency to practice. All three of these classes were duly provided for and protected by the various enactments of the legislature, from time to time.

Damages for Negligent Treatment of Fracture Necessitating Amputation

(McAlinden vs. St. Maries Hospital Association (Idaho), 156 Pac. R. 115)

The Supreme Court of Idaho affirms a judgment in favor of the plaintiff, conditioned on his waiver to make it $8,640, instead of $12,000. The court says that the plaintiff, while in the employ of a lumber company, one Thursday morning sustained a simple comminuted fracture of both bones of the right leg at a point about 2 inches above the ankle joint. The lumber company had an arrangement with the defendant association whereby the latter, in consideration of a monthly fee paid by the employees into a hospital fund, treated them in cases of accident or illness. The plaintiff was taken first to a hospital of the defendant at another place, and on the following Monday afternoon to the one at St. Maries. The negligence complained of consisted in the placing on his leg, on said Thursday, of a circular plaster of Paris cast and a failure to remove or split it while he was at the first hospital, thereby causing a venous constriction of the limb, whereby it became infected with moist gangrene, which necessitated amputation near the juncture of the upper and middle third of the tibia and fibula. The defendant contended that the conditions which developed fully justified the use of the cast, and that the failure to remove or split the same, other than as was done, resulted in no injury to the plaintiff and was not the proximate cause of the amputation of the injured limb, but that this was due to dry gangrene caused by arterial injury. The court thinks the evidence was sufficient to support a verdict in favor of the plaintiff. If it were possible for men learned in the science of medicine and surgery to agree as to the exact result that will follow a given injury under certain treatment, or what is the proper treatment of a given injury, all doubt, touching the question of whether a physician or surgeon has properly treated the patient for the injury and just what constitutes diligent and skilful or negligent and unskilful treatment, might be removed. But where eminent physicians and surgeons emphatically disagree in their opinions, the most salutary method thus far provided for the administration of justice in cases of this kind is to submit these disputed questions of fact to a jury composed of twelve men of widely different walks of life and of radically different intellects, and permit them to weigh and average the whole evidence and arrive at a final unanimous conclusion. Whether the defendant's physician and surgeon exercised that degree of skill and learning possessed by the average member of the medical and surgical professions in good standing in the community, and used that reasonable care and diligence according to his best judgment in treating the plaintiff's injured limb that the average member of the profession would have used, were questions of fact exclusively for the jury to determine. This rule is not changed by reason of the fact that men learned in the science of medicine and surgery have given conflicting testimony touching the required and approved treatment of an injury. While it may be true in this case that the jury in reaching its verdict was not in a position to say beyond the possibility of a doubt that any one single fact in evidence or the absence of any one condition established conclusively the negligence of the defendant's physician and surgeon in placing the cast on the injured limb at the time and in the manner in which it was done, and in his failure to split the cast and thus permit free and uninterrupted venous circulation, yet if, from all the testimony and circumstances of the case, there was evidence sufficient to establish a prima facie case, the conclusion reached by the jury based on this evidence will not be disturbed on appeal. The court, however, thinks that $8,640 should compensate the plaintiff for the pain and

suffering, as well as the loss of the injured limb, so far as such loss could be properly compensated in dollars and cents. An examination of a number of authorities from other states showed that courts have invariably, for similar injuries, held verdicts in excess of the amount fixed by this court to be excessive.

Lawful Prescribing of Morphin

(Fyke vs. State (Tex.), 184 S. W. R. 197)

The Court of Criminal Appeals of Texas reverses a judgment of conviction of defendant Fyke, a physician, who was charged with having unlawfully prescribed morphin for the use of an alleged habitual user of morphin. The latter testified that she had become bedridden, and when she first called the defendant in, he had to treat her for peritonitis and a swollen condition of the groins and inflammation of the bowels. It appeared that he administered the morphin for two purposes: first, to relieve her of her present suffering, and, second, to cure her of her habit, succeeding in both. The court holds that if the defendant gave the medicine to relieve the woman of pain at the time he was called in, this should not have been made the basis of a conviction; that if he, as a lawful practicing physician, administered morphin to his patient, who was suffering with peritonitis and abscesses in the groin, and it was known to him, and he did it for that purpose, he would not be violating the Texas statute. Moreover, the jury should have been instructed that, if they had any reasonable doubt as to whether or not he prescribed the drug in good faith, believing it to be necessary in the treatment of such diseases, it would be their duty to acquit. If they had such reasonable doubt, he was entitled to the benefit of the doubt, although the jury should find and believe that the patient was a habitual user of the drug. Nor would the defendant be guilty of a violation of the statute if, in treating or curing her of the habit itself, he administered the drug in such way as it assisted in curing the habit. Excluded testimony wherein it was offered to be shown by the defendant that the size of the dose of morphin gradually grew less, until it altogether ceased, under his treatment, should have gone before the jury. It bore directly on the case, and was pertinent to show his good faith in using the morphin to cure the habit of using that drug. It will be observed, from a casual reading of Article 748 of the penal code, that its denunciations are leveled at practitioners, or prohibits practitioners from administering morphin to habitual users of that drug or any of the drugs mentioned. It is also discernible on the face of the statute that it was not intended to prevent practitioners from administering this drug in case of sickness, or to alleviate pain, or to cure the habit of using morphin. In other words, its provisions seem to be directed against the named physicians or practitioners with a view of prohibiting them from prescribing or administering these mentioned drugs to habitual users in order to continue their use. It does not interdict the administration of these drugs when it is necessary to alleviate pain or to cure the habit. Therefore, if the practitioner administers it to alleviate such pain, or uses it in good faith where the party is sick, or as a means of finally curing the habit, it is not within the statutory denunciation.

Society Proceedings

COMING MEETINGS

Am. Assn. for the Study and Prev. of Inf. Mort., Milwaukee, Oct. 19-21.
American Association of Railway Surgeons, Chicago, Oct. 17-19.
American Public Health Association, Cincinnati, Oct. 24-27.
Clinical Congress of Surgeons, Philadelphia, Oct. 23-28.
Delaware State Medical Society, Milford, Oct. 9-10.
Kentucky State Medical Association, Hopkinsville, Oct. 24-27.
Minnesota State Medical Association, Minneapolis, Oct. 11-13.
Mississippi Valley Medical Association, Indianapolis, Oct. 10-12.
Nevada State Medical Association, Reno, Oct. 10-12.
New Mexico Medical Society, Albuquerque, Oct. 11-13.
Southern Medical Association, Atlanta, Nov. 13-16.
Vermont State Medical Society, St. Johnsbury, Oct. 12-13.
Virginia State Medical Society, Norfolk, Oct. 24-27.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Obstetrics and Diseases of Women and Children, York, Pa.

September, LXXIV, No. 3

1 Adenocarcinoma of Corpus Uteri; Nearly Complete Removal by Curet. 2. Ectopic Chorio-Epithelioma of Pelvis. R. T. Frank, New York.—p. 369.
2 Case of General Edema of Fetus. H. C. Williamson, New York.—p. 376.
3 Case of Carcinoma of Cecum in Girl Twenty-Three Years of Age. J. R. Eastman, Indianapolis.—p. 380.
4 Congenital and Acquired Retropositions of Uterus; Their Differentiation and Relative Significance. A. Sturmdorf, New York.—p. 386.
5 Case of Syncytioma Malignum. K. Adachi.—p. 397.
6 *Protective Action of High Carbohydrate Diet and Oxygen on Liver Cells in Experimental Chloroform Poisoning, with Its Possible Application in Pre-Eclamptic Toxemia. R. T. Lavake, Minneapolis.—p. 401.
7 *Rupture of Scar of Previous Cesarean Section. P. Findley, Omaha.—p. 411.
8 *Results from Pituitary Extract in Obstetrics; Report of Case of Rupture of Uterus Following Its Use. L. G. McNeile, Los Angeles.—p. 432.
9 *Relationship Between Pelvic Disease and Manic Depressive Insanity. G. Gibson, Brooklyn.—p. 439.
10 Sarcomatous Change in Uterine Fibroids. W. J. Maroney, New York.—p. 445.
11 Etiology of Sterility in Women. G. B. Miller, Washington, D. C.—p. 450.
12 Lessened Fertility of Women, Especially American Women. I. S. Stone, Washington, D. C.—p. 454.
13 Indications for and Advisability of Artificial Sterilization. R. Y. Sullivan, Washington, D. C.—p. 458.
14 Tuberculous Peritonitis. C. R. Hyde, Brooklyn.—p. 466.
15 Endocrine Glands in Their Relation to Female Generative Organs. W. Timme, New York.—p. 474.
16 Syphilis of Uterus. D. W. Prentiss, Washington, D. C.—p. 480.
17 Congenital Occlusion of Bile Ducts. J. Foote and R. Hamilton, Washington, D. C.—p. 521.

6. **Action of High Carbohydrate Diet and Oxygen.**—Lavake states that Opie and Alford are justified in believing that a high carbohydrate diet might be of marked value in pre-eclamptic toxemia and his own experiments point to the fact that the administration of oxygen, as advocated empirically by Stroganoff, or treatment in the open air may have a rational pathologic basis for support.

7. **Rupture of Cesarean Scar.**—Sixty-three published cases are analyzed by Findley. He is convinced that a perfectly healed cesarean wound may be relied on to resist the forces of labor, but in view of the fact that the integrity of the wound is an unknown factor in all cases, he says, we are constrained to exercise the utmost caution in the conduct of every case in pregnancy and labor following cesarean section. Failure to secure perfect healing is accounted for by departure from the principles of suture proposed by Sänger and by septic infection of the uterine wound. The possible existence of latent gonorrheal infection may defeat the most painstaking efforts to secure perfect wound healing. When cesarean section has been followed by a fever course the uterine wound should be regarded as insecure in event of a subsequent pregnancy, and should call for a repeated cesarean section at the onset of labor. Sterilization and hysterectomy should replace conservative cesarean section when infection is known to exist. The alternative invites faulty wound healing, if not more disastrous results. Transverse fundal, extraperitoneal and cervical incisions have not lessened the liability of rupture in subsequent labors, but, on the contrary, have probably increased the hazard. The possibility of rupture of the scar following cesarean section does not justify sterilization, but rather calls for the exercise of masterly control in event of a subsequent pregnancy. All such cases should be hospital cases and labor should be anticipated by timely repetition of cesarean section at the onset of labor if the uterine wound is known to be defective or if some cause for obstruction to the delivery of the child through the natural passage exists. Version, high forceps, uterine tampons, hydrostatic bags, and pituitary extract should never be employed in the presence of a cesarean scar.

8. **Results from Pituitary Extract in Obstetrics.**—In the case reported by McNeile the conditions present before the drug was given were a well engaged head, complete dilatation, ruptured membranes, and a decrease in the strength of the uterine contractions. The fault to be found with its use in this case lay in the nonrecognition of an obliquely contracted pelvis.

9. **Pelvic Disease and Manic Depressive Insanity.**—Gibson states that no mental improvement may be expected to follow an operation performed on the pelvic organs of a woman who is suffering from a psychosis which is characterized by dementia. An operation for the correction of lesions in the pelvis is justifiable in a woman who has manic depressive insanity and some improvement may be hoped for if the operation is performed in the first or second attack. The pelvic pathology is not the cause of the psychosis but may act as the exciting cause of an attack in a woman of neuropathic stock. The effect of the operation may be an indirect one by improving the general physical condition of the patient.

Archives of Pediatrics, New York

September, XXXIII, No. 9

18 Meningococcus Meningitis with Unusual Hemorrhagic Manifestations and Demonstration of Diplococcus in Skin. C. T. Sharpe, New York.—p. 641.
19 Antoserum Treatment of Chorea. A. L. Goodman, New York.—p. 649.
20 *Early Morning Toxic Vomiting in Children. T. S. Southworth, New York.—p. 654.
21 *Twelve Cases of Spasmophilia, Etiology and Treatment. F. P. Webster, Portland, Me.—p. 658.
22 Case of Hirschsprung's Disease with Bibliography to January 1, 1916. R. Cadwallader, San Francisco.—p. 665.
23 *Studies on Parenteral Infections. J. R. Gerstley, Chicago.—p. 671.
24 *Unusual Case of Hydrocephalus. R. D. Moffett, New York.—p. 679.

20. Abstracted in THE JOURNAL, July 8, p. 146.

21. **Spasmophilia, Etiology and Treatment.**—Webster is of the opinion that spasmophilia is due to overfeeding, especially of carbohydrate food, more especially in fermentable form, and that dietetic treatment similar to that of Grulee is most effectual.

23. **Parenteral Infections.**—From the study of 200 cases of parenteral infection Gerstley concludes that parenteral infections in many cases are associated with a mild or moderate diarrhea. If the child is allowed to drink as he sees fit, this diarrhea rarely develops into a severer disturbance. It almost never does in children on a mixed diet. The very few cases of severer disturbances which developed followed no rules that Gerstley could discover. They did not depend on: (*a*) anatomic situation of the infection, as bronchitis, otitis or cystitis; (*b*) degree, length or severity of the infection; (*c*) on constitutional inferiority of the child, or on (*d*) the outcome of the disease. Gerstley believes that in many cases the initial diarrhea and vomiting occurring before admission to the hospital are due to the invariable dose of castor oil, and some clinical charts show diarrheas associated with coughs occurring in the hospital, conditions which seem also to be related to the medication in some way, as, for example, aromatic spirits of ammonia. In some cases the cough disappears as the nutrition improves.

24. **Unusual Case of Hydrocephalus.**—This case of hydrocephalus began at birth and, Moffett says, in all probability was not so much due to the fact that the spinal fluid was secreted in too large a quantity, for if this were the case the head would have filled more rapidly after puncture than it did, but it was due to a lessened absorbing power of the membrane covering the brain and of the spinal cord. Only 15 c.c. of spinal fluid was obtained by lumbar puncture, which would indicate that there was undoubtedly some obstruction in the aqueduct of Sylvius. The exact nature of this obstruction could not be determined as no postmortem examination was available.

Boston Medical and Surgical Journal

September 21, CLXXV, No. 12

25 *Rat and Infantile Paralysis. M. W. Richardson, Boston.—p. 397.
26 Some Medical Aspects of Workmen's Compensation Act. F. D. Donoghue, Boston.—p. 400.
27 Major Divisions of Mental Hygiene — Public, Social, Individual. E. E. Southard, Boston.—p. 404.
28 What Recent Investigations Have Shown to Be Relation Between Mental Defect and Crime. A. W. Stearns, Boston.—p. 406.
29 Epilepsy. E. Flood, Boston.—p. 408.
30 Idiosyncrasy to Cow's Milk; Its Relation to Anaphylaxis. F. B. Talbot, Boston.—p. 409.
31 Treatment of Tuberculosis in Infancy. W. W. Howell, Boston. —p. 411.

25. **Rat and Infantile Paralysis.**—The following facts supporting the theory that the disease is transferred by rodents, insects, or both are offered by Richardson. (1) Summer incidence of the disease; (2) the resemblance of the disease in its epidemiology to malaria and yellow fever has been noted more than once; (3) the positive results of Rosenau and also of Anderson and Frost, together with the successful experiment of Flexner with the bedbug. That the bedbug might be the intermediate link in the chain seemed to Richardson highly improbable in view of the fact that infantile paralysis attacks with almost equal frequency all strata of society. The possible relation of the rat to infantile paralysis was first brought to Richardson's attention in 1910 through an observation made by Dr. Charles E. Simpson, state inspector of health. In investigating an epidemic of the disease, Dr. Simpson observed the fact that many rats, whose homes had been in a town dump, were compelled, because of a fire in that dump, to seek refuge in the neighboring houses. In these houses infantile paralysis seemed to be unduly prevalent. Another experience pointing in the same direction occurred in a small country neighborhood occupied as a summer colony by a number of city residents. The only immediate unusual factor to be assigned for this epidemic was the removal, from one situation to another, of an old barn. The barn cellar was dug up and improved, and, during this operation, the affected children played in the excavation. The inference is, of course, that many old rat holes were destroyed and that the accumulation of years in the way of rat disease and fleas may have been distributed broadcast to the outside world. A third observation, but a rare one, was made in a Massachusetts city where, in an infected district, many rats were said to have been found dead. In another city a muddy river and its tributaries honeycombed to a greater or less extent the municipality. The location of the cases of infantile paralysis seemed to have a remarkable relation to this stream and its branches. Indeed, the whole Massachusetts experience seems to indicate that the disease has been endemic along its rivers, most of which are polluted by sewage to a greater or less extent. The possible association of the water rat was thus indicated.

The great increase in poliomyelitis during the last twenty-five years has been explained as due to the great increase in facility of transportation all over the world, so that infinitely increased human contact has become possible. The same argument would apply, however, to the transfer of infected rats from one locality to another. Indeed such transfer in freight cars and ships carrying grain, cattle, pigs, etc., must be common. The relation to the railroads of cases of infantile paralysis has been noticed by a number of observers.

Nothing could be more probable than that children living near railroads should play in rat infected freight cars. Infected rats, furthermore, if dropped from freight cars, would necessarily seek their food in the immediate neighborhood. In the transfer of the infection from the rat to man, the agency of the flea is assumed, although the possible contamination of food by rodent excretions might well be considered. The insect transfer might be simply mechanical or it might require a preliminary cycle of development of the virus in the flea. Furthermore, the possible rôle of cats, dogs and other animals, or even human beings, as carriers of infected fleas, would be apparent. Moreover, in grossly unsanitary surroundings, the fleas might carry infection from one child to another directly. These theories, Richardson says, explain better than any other hypothesis submitted the epidemiologic facts as observed in infantile paralysis.

Colorado Medicine, Denver

August, XIII, No. 8

32 Tonsils and Their Relation to Systemic Infections. D. A. Vanderhoof, Colorado Springs.—p. 233.
33 Postpartum Hemorrhage, Its Management. J. Lindahl, Denver. —p. 238.

34 Some Difficulties in Early Diagnosis of Tabes Dorsalis. P. Work, Pueblo.—p. 245.
35 Gas Oxygen Anesthesia and Its Limitations. J. W. Seybold, Denver.—p. 248.
36 Records of Plague. W. H. Crisp, Denver.—p. 250.

Journal of Abnormal Psychology, Boston

August-September, XI, No. 3

37 Irrelevancy of Dreams. L. H. Horton.—p. 143.
38 Utilization of Psychanalytic Principles in Study of Neuroses. J. J. Putnam, Boston.—p. 172.
39 Permutations Within Sphere of Consciousness. T. Burrow, Baltimore.—p. 178.
40 Analysis of Manifest Delusions from Subject's Point of View. E. E. Southard, Boston.—p. 189.

Journal of Biological Chemistry, Baltimore

September, XXVI, No. 2

41 Effect of Amino-Acid Content of Diet on Growth of Chickens. T. B. Osborne and L. B. Mendel, New Haven, Conn.—p. 293.
42 Effects of Temperature and Fever on Synthesis of Ethereal Sulfuric and Urochloralic Acids in Organism. H. Ito, Japan.—p. 301.
43 *Accumulation of Uric Acid in Tissues During Suppression of Urine. H. G. Wells, Chicago.—p. 319.
44 *Fate of Ingested Starch in Phlorhizin Diabetes. F. A. Csonka, Pittsburgh.—p. 327.
45 *Experimental Studies on Creatin and Creatinin. Protein Feeding and Creatin Elimination in Pancreatic Diabetes. W. C. Rose, Galveston, Texas.—p. 331.
46 *Id. Protein Feeding and Creatin Elimination in Fasting Man. W. C. Rose, F. W. Dimmitt and P. N. Cheatham, Galveston, Texas.—p. 339.
47 *Id. Fate of Creatin and Creatinin when Administered to Man. W. C. Rose and F. W. Dimmitt, Galveston, Texas.—p. 345.
48 Relation Between Configuration and Rotation of Epimeric Monocarboxylic Sugar Acids. P. A. Levene and G. M. Meyer, New York.—p. 355.
49 Optical Rotation of Epimeric a-Hexosaminic Acids. P. A. Levene, New York.—p. 367.
50 Conjugated Sulfuric Acid of Funis Mucin (Mucoitin Sulfuric Acid). P. A. Levene and J. López-Suárez, New York.—p. 373.
51 Creatin in Human Muscle. W. Denis, Boston.—p. 379.
52 Aromatic Constituents of Urine. Nonphenolic Volatile Oils of Cow Urine. R. J. Anderson, Geneva, N. Y.—p. 387.
53 Id. Nonphenolic Volatile Oils of Goat Urine. R. J. Anderson, Geneva, N. Y.—p. 401.
54 Id. Nonphenolic Volatile Oils of Horse and Human Urine. R. J. Anderson, Geneva, N. Y.—p. 409.
55 *Lipoids ("Fat") of Blood in Diabetes. W. R. Bloor, Boston.—p. 417.
56 *Chemical Nature of "Vitamins." Isomerism in Natural Antineuritic Substances. R. R. Williams and A. Seidell, Washington, D. C.—p. 431.
57 Relation of Quality of Proteins to Milk Production. E. B. Hart and G. C. Humphrey, Madison, Wis.—p. 457.
58 Nitrogen Determinations by Direct Nesslerization. Total Nitrogen in Urine. O. Folin and W. Denis, Boston.—p. 473.
59 Id. Nonprotein Nitrogen in Blood. O. Folin and W. Denis, Boston.—p. 491.
60 Id. Ammonia in Urine. O. Folin and W. Denis, Boston.—p. 497.
61 Id. Urea in Urine. O. Folin and W. Denis, Boston.—p. 501.
62 Id. Urea in Blood. O. Folin and W. Denis, Boston.—p. 505.
63 *Relative Excretion of Phenols by Kidneys and by Intestine. O. Folin and W. Denis, Boston.—p. 507.
64 Effect of Addition of Alkali to Sea Water on Hydrogen Ion Concentration. A. R. Haas, Cambridge, Mass.—p. 515.
65 Translocation of Seed Protein Reserves in Growing Corn Seedling. C. J. V. Pettibone and C. Kennedy, Minneapolis.—p. 519.
66 *Influence of Color from Sodium Picrate in Determination of Creatinin in Blood and Urine. F. H. McCrudden and C. S. Sargent, Boston.—p. 527.
67 Relation of Amid Nitrogen to Nitrogen Metabolism of Pea Plant. B. Sure and W. E. Tottingham, Madison, Wis.—p. 535.

43. **Uric Acid in Tissues.**—A young woman, previously in good health, took about 17 grains of bichlorid of mercury. She lived nine days under close observation. During the entire time she excreted but 96 c.c. of urine in spite of intravenous injections of alkaline salt solution (Fischer's solution) and hypertonic sugar solution, and renal decapsulation. Necropsy was performed less than one hour after death by Dr. B. O. Raulston, who kindly preserved the organs and Wells analyzed the viscera for uric acid. The result of these analyses is definite. After practically complete suppression of urine for a period of nine days, despite a practically purin free diet and approximate fasting during that period, the tissues contained relatively large amounts of uric acid which could be readily isolated pure in quantities sufficient for analysis. In four other bodies of persons dying with either approximately normal or but slightly impaired renal function, little or no uric acid could be recovered by the same methods. It is, therefore, certain says Wells that after complete suppression of urine there may occur an accumulation of uric acid in the tissues not observed in the bodies of persons whose kidneys are functioning. Such an observation is not in favor of the hypothesis that the human body has the power of destroying uric acid, although it is by no means conclusive evidence to the contrary.

44. **Phlorhizin Diabetes.**—According to Csonka starch given to completely phlorhizinized dogs is not utilized but is eliminated quantitatively in the urine as "extra glucose." There was not observed any difference in the failure to utilize the starch of wheat flour and the starch of oatmeal.

45. **Protein Feeding Creatin Elimination in Diabetes.**—Protein feeding in dogs after complete extirpation of the pancreas did not in Rose's experiments lead to the disappearance of creatin from the urine as does similar feeding in normal fasting animals. While protein feeding does not reduce the creatin output to zero, there is a slight decrease in the amount eliminated, which is attributed to the utilization of that amount of sugar represented by the difference between the ratios 3.65 : 1 and 2.8 : 1 (beta-glucose of Mandel and Lusk). The behavior of the creatin elimination in phlorizin and pancreatic diabetes offers additional, and Rose believes conclusive proof of the dependence of the creatin elimination on the carbohydrate utilization.

46. **Protein Feeding and Creatin Elimination in Fasting Man.**—Contrary to the generally accepted idea, protein feeding in starving man promptly reduces the creatin output to nil. The amount of acetone bodies present in the urine during short fasts (three to four days) is not sufficient to render the creatin-creatinin figures unreliable. Four times the quantities of acetone and diacetic acid eliminated in the present experiments were entirely without effect on the creatinin readings.

47. **Fate of Creatin and Creatinin when Administered to Man.**—The ingestion of large doses (20 grains) of creatin in man leads to a very perceptible increase (0.30 to 0.40 gm.) in the output of creatinin. This increase in urinary creatinin is attributed to a conversion of creatin into its anhydrid, and not to an increase in the output of endogenous creatinin. The ingestion of large doses (16 grains) of creatinin is not followed by the appearance of creatin in the urine. This indicates that the reaction creatin creatinin plus water is probably not a reversible one in the human organism. No evidence was obtained by Rose and Dimmitt indicating a transformation of creatin or creatinin into urea by the body cells. On the contrary, urea is probably not a catabolic product of these substances.

55. **Blood Lipoids in Diabetes.**—A group of patients in various stages of the disease all living in one house, under the care of a single physician and in charge of a single nurse was studied by Bloor. The treatment given these patients consisted essentially of fasting till sugar free and then building up a tolerance for carbohydrate and protein. A notable feature in the treatment was that considerable attention was given to the fat of the diet. In severe diabetes the blood lipoids were all markedly increased, up to 100 per cent. or more of the normal values. In mild diabetes the lipoids may be normal. In general the more severe or long standing the diabetic condition the more marked was the abnormality in the blood lipoids. In spite of the high values the relations between the lipoids were practically those of normal individuals, indicating that the fat metabolism was essentially normal. There was a tendency, however, for the fat to accumulate in excess of the other constituents and this fact and possibly also the high lipoid values foreshadow the lipemia. The high lipoid values noted occurred entirely in the plasma, the composition of the corpuscles remaining practically normal. The fact that cholesterol increased parallel with the fat in diabetic blood, even in severe lipemia gives further support to the earlier assumption that cholesterol has a part and probably an important part in fat metabolism. For the same reason the determination of cholesterol in the plasma (a relatively simple process) should give valuable information regarding the lipoid content of the blood in diabetes. In the present series no definite relation could be

found between high blood lipoids and the occurrence of acetone bodies in the urine.

56. **Chemical Nature of Vitamins.**—Williams and Seidell suggest, on the basis of their research, that an isomer of adenin is the chemical entity responsible for the characteristic physiologic properties of the "vitamin" under investigation.

63. **Relative Excretion of Phenols by Kidneys and Intestine.**—A colorimetric method for the determination of phenols in stools is described by Folin and Denis. From a study of the urinary and intestinal phenol excretion in normal men, the conclusion is reached that normally, and in the absence of diarrhea, laxatives or enemas, a very small fraction (from 7 to 20 per cent.) of the phenols formed is eliminated by the intestine.

66. **Determination of Creatinin in Blood and Urine.**—From the data obtained by McCrudden and Sargent they are convinced that in the determination of creatinin in the blood the color due to creatinin is such a small proportion of the total color that analysis gives no information whatever concerning the amount of creatinin present; the slight variations obtained in duplicates can be accounted for by slight variations in the amount of picric acid in the solution. In the light of these experiments it is clear that all that has been written hitherto concerning the physiology of creatinin and creatin needs careful revision; much of it will have to be modified, some of it—all that concerning creatinin and creatin in the blood, for example—will have to be rejected altogether.

Journal of Nervous and Mental Disease, Lancaster, Pa.

September, XLII', No. 3

68 *Acroparesthesia. J. J. Putnam, Boston.—p. 193.
69 Recurrent Poliomyelitis; Second Attack After Period of Three Years. E. W. Taylor, Boston.—p. 207.
70 *Clinical Value of Defense and Muscle Reflexes. Importance of Latter in Spinal Localization. T. H. Weisenburg, Philadelphia. —p. 217.
71 Family Spastic Paralysis. J. H. W. Rhein, Philadelphia.—p. 224.

68. **Acroparesthesia.**—Referring to the use of quinin in this affection, Putnam says, that there is no question that this drug, when given in doses of 10 or 15 grains, or even more, is exceedingly beneficial when the numbness is present in a paroxysmal form. But he does not believe that one does wisely to continue it for very long, or that one can use it as a final remedy. The benefit to be derived from it is rather of a similar sort to that obtained through the same means in the typical neuralgia of the superorbital branch of the fifth nerve. While the results are often very striking, the final effect is rather to postpone an attack than really to cure it. In acroparesthesia, quinin might help to break up a morbid habit, and Putnam has used it only for that purpose, giving a large dose on three successive nights and repeating this treatment once a week.

70. **Clinical Value of Defense and Muscle Reflexes.**—Exaggerated muscle reflexes, Weisenburg says, are constantly present in pyramidal lesions and are of equal importance with increased tonicity and increased tendon reflexes. In spinal localization they are of value, for in destructive lesions they are either absent or diminished in the peripheral area corresponding to the lesion. In such cases the muscle jerks may be increased just above the lesion but are always exaggerated in the parts of the body below the lower limit of the lesion, even though the skin and tendon reflexes are diminished or lost. In incomplete lesions of the spinal cord the muscle reflexes are exaggerated up to the upper limit of the lesion. In a gradually extending upward paralysis such as is produced by a pressure myelitis the exaggeration of the muscle reflexes keeps pace with the increase of the paralysis and is an indication of an extension of the lesion. The most important conclusion that can be drawn according to the author is that the exaggeration and more especially the absence of a muscle reflex is an indication of the state of the reflex arc in the spinal segment corresponding to that particular muscle.

Journal-Lancet, Minneapolis

September 15, XXXVI, No. 18

72 Acute Mastoiditis. A. E. Johnson, Watertown, S. D.—p. 527.
73 Suppurative Mastoiditis — Surgical Emergency. F. J. Putnam, Sioux Falls, S. D.—p. 531.
74 Transplantation of Bone in Fractures. M. S. Henderson, Rochester, Minn.—p. 540.
75 Local Anesthesia. L. E. Daugherty, St. Paul.—p. 544.

Kansas Medical Society Journal, Topeka

September, XVI, No. 9

76 Indications and Modern Methods for Blood Transfusions. E. S. Edgerton, Wichita.—p. 251.
77 Fractures. R. C. Lowman, Kansas City.—p. 255.
78 Team Work in Medicine. J. T. Axtell, Newton.—p. 258.
79 Some Obstetric Emergencies. F. T. Van Eman, Kansas City, Mo. —p. 260.
80 Early Diagnosis and Treatment of Syphilis. W. K. Trimble, Kansas City, Mo.—p. 266.

Medical Record, New York

September 16, XC, No. 12

81 Some Practical Notes on Blood Pressure. G. V. N. Dearborn, Cambridge, Mass.—p. 478.
82 Pathologic and Therapeutic Bearings of Elimination of Body Heat. J. B. Nichols, Washington, D. C.—p. 492.
83 Coins and Medals in Medicine. W. J. Mallory, Washington, D. C —p. 495.
84 General Principles to Be Observed in Bone Transplantations. C. A. McWilliams, New York.—p. 498.
85 State Medical Service as Contrasted with Panel System for Care of Industrial Workers. A. C. Burnham, New York.—p. 500.
86 Speech, Its Culture and Refinement; What Is Done for It in Holland. N. J. P. Van Baggen, Hague, Holland.—p. 502.
87 Medical Education in Chemistry. F. S. Hammett, Los Angeles.— p. 503.

September 23, No. 13

88 Present Status of Chronic Multiple Arthritis, with Special Consideration of Infection as Etiologic Factor. G. R. Elliott, New York.—p. 529.
89 Malignant Transformation of Benign Intestinal Growths. F. C. Yeomans, New York.—p. 537.
90 Fracture and Dislocation of Proximal End of First Metacarpal Bone and Fracture of Trapezium. C. W. Perkins, New York.— p. 539.
91 Report of Seventy-Seven Cases of Acute Poliomyelitis Treated in New York Throat, Nose and Lung Hospital by Intraspinal Injections of Epinephrin Chlorid. P. M. Lewis, New York.—p. 540.
92 Reflections on Poliomyelitis. D. W. Wynkoop, Babylon.—p. 545.
93 Clinical Delimitation of Hysteria. M. Solomon, Chicago.—p. 546.
94 Fatality Following Acute Otitis. I. W. Voorhees, New York.— p. 548.

New York Medical Journal

September 16, CIV, No. 12

95 Epilepsy. C. A. L. Reed, Cincinnati.—p. 529.
96 Reed's Bacillus of Epilepsy. A. J. Hinkelmann, Galesburg, Ill.— p. 531.
97 Pathogenesis and Treatment of Epilepsy. H. A. Cotton, E. P. Corson-White, Philadelphia, and W. W. Stevenson, Trenton, N. J.—p. 532.
98 Toxic Manifestations of Epilepsy and Their Rational Treatment. R. H. Spangler, Philadelphia.—p. 534.
99 Pelvic Infection. A. J. Walscheid, New York.—p. 540.
100 Hemiplegia. W. Martin, Atlantic City, N. J.—p. 544.
101 Secondary Syphilitic Lesions of Tongue. C. Saison, Paris.—p. 547.
102 Medicine and Surgery in Modern Warfare. B. Jablons, San Francisco.—p. 549.
103 Treatment of Bladder and Urethral Papillomata. G. Greenberg, New York.—p. 553.
104 Invariable Blood Stain. B. G. R. Williams, Paris, Ill.—p. 553.

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105 Psychology of Diseases of Respiratory Tract. G. Hudson-Makuen, Philadelphia.—p. 577.
106 Hospital Treatment of Simple Chorea. P. Bailey, New York.—p. 580.
107 Infective Pulmonary Endarteritis Occurring with Patent Ductus Arteriosus. M. Manges, New York.—p. 581.
108 Acute Anterior Poliomyelitis. A. Gordon, Philadelphia.—p. 583.
109 Anterior Poliomyelitis: Aftermath. L. O. Wight, New York.—p. 585.
110 Occupational Specialization in Defective. H. M. Friedman, New York.—p. 587.
111 Congenital Syphilis. W. J. Heimann, New York.—p. 592.
112 Problems of Adolescence in Relation to Social Hygiene. H. W. Wright, San Francisco.—p. 596.
113 Bothriocephalus Latus Infestation. A. I. Rubenstone, Philadelphia. —p. 599.
114 Cysto-Urethroscope for Diagnosis and Therapeutics. C. Morales-Macedo, New York.—p. 600.

New York State Journal of Medicine

September, XVI, No. 9

115 *Gynecologic Surgery in Hystero-Neurasthenic Patients. H. S. Crossen, St. Louis.—p. 427.
116 Genital Reflexes and Their Rôle in Production of Symptoms Arising in Pelvis. R. R. Smith, Grand Rapids, Mich.—p. 429.
117 Functional and Organic Differentia in Nervous Diseases as Shown by Cases. T. A. Williams, Washington, D. C.—p. 435.
118 *Acute Epidemic Poliomyelitis — Contact Infection. P. A. E. Sheppard, Boston.—p. 442.
119 Recent Ideas Concerning Diagnosis and Vaccine Therapy of Iridocyclitis; Report of Case. L. M. Francis, Buffalo.—p. 447.

120 Eye in General Practice. H. W. Cowper, Buffalo.—p. 454.
121 *Endoscopy of Esophagus and Upper Air Passages in Children. C. J. Imperatori, New York.—p. 456.
122 Responsibility of Physician in Control of Cancer. A. J. Brown, New York.—p. 462.
123 Bird Shot Found in Appendix. J. N. Vander Veer, Albany.—p. 465.
124 Fractures. C. O. Barney, Syracuse.—p. 466.
125 Pin Worms as Cause of Appendicitis. A. W. Armstrong, Canandaigua.—p. 470.

115. Abstracted in THE JOURNAL, June 24, p. 2124.

118. **Acute Epidemic Poliomyelitis.**—Sheppard cites a considerable number of cases divided into eight groups in which the grouping around some common source of infection is of such a character as to strikingly point to acute epidemic poliomyelitis being a contact infection which would establish the contagiousness of the disease. Sheppard urges that acute epidemic poliomyelitis be handled by the health authorities as a contact infection.

121. **Endoscopy of Esophagus.**—Imperatori urges that endoscopy of the esophagus and upper air passages in children and also in adults, should be made use of more than it is, as a means of precise diagnosis.

Northwest Medicine, Seattle, Wash.

August, XV, No. 8

126 Some Needs of Profession. J. R. Brown, Tacoma.—p. 251.
127 Suppurations of Lung and Pleura with Their Surgical Indications. S. E. Lambert, Spokane.—p. 253.
128 Chronic Myocarditis with Embolic Manifestations and Fever Simulating Clinical Course of Bacterial Endocarditis; Report of Case. I. C. Brill, San Francisco.—p. 257.
129 Treatment of Certain Forms of Sterility in Female. A. C. Martin, Seattle.—p. 260.
130 Infant for Adoption. J. B. Manning, Seattle.—p. 264.
131 Pyloric Stenosis in Infancy. P. D. McCornack, Spokane.—p. 266.
132 Toxemia of Pregnancy, Some Thoughts Suggested by Three Recent Cases. F. T. Hyde, Port Angeles.—p. 268.

Pennsylvania Medical Journal, Athens

September, XIX, No. 12

133 Tuberculosis, Some Words to General Practitioner. W. Brinton, Philadelphia.—p. 885.
134 Concentrated Sunlight in Treatment of Tuberculous Lesions. F. A. Johnston, Socorro, N. M.—p. 891.
135 Sectional Method of Teaching and Studying Macroscopic Anatomy. J. P. Schaeffer, Philadelphia.—p. 894.
136 Dermatitis Caused by Cosmetics and Wearing Apparel, Particularly Those Containing Paraphenylendiamin. F. C. Knowles, Philadelphia.—p. 897.
137 Plea for More Necropsies. S. M. Martsolf, Westover.—p. 900.
138 Local Anesthesia in Minor Surgery. C. W. McElhaney, Greenville.—p. 904.
139 Radium in French Military Surgery. W. H. Cameron, Pittsburgh.—p. 906.
140 Pain as Indication for Surgical Interference. R. J. Behan, Pittsburgh.—p. 908.

Southwest Journal of Medicine and Surgery, El Reno, Okla.

September, XXIV, No. 9

141 Differential Diagnosis Between Gastric Ulcer, Gallstones and Diffuse Gastritis. W. T. Grove, Eureka, Kan.—p. 253.
142 Pelvic Mechanotherapy. F. A. Harper, Pittsburg, Kan.—p. 267.
143 Clinical and Pathologic Aspects of Primary Sarcoma of Large Intestine. C. Potter, St. Joseph, Mo.—p. 276.

Texas State Journal of Medicine, Fort Worth

September, XII, No. 5

144 Some Phases of Typhoid. M. L. Graves, Galveston.—p. 209.
145 Isolation of Bacillus Typhosus from Bile in Typhoid. B. Reading, Galveston.—p. 211.
146 Ovarian Transplantation; Report of Cases. W. D. Phillips, New Orleans.—p. 213.
147 Disordered Menstruation as Symptom of Disease. H. L. D. Kirkham, Houston.—p. 218.
148 Postoperative Insanity. W. L. Secor, Kerrville-on-the-Gaudalupe.—p. 220.
149 Diagnosis of Pernicious Anemia. G. C. Kindley, Dallas.—p. 222.
150 Sympathetic Ophthalmia. J. H. Burleson, San Antonio.—p. 225.
151 Symptoms and Treatment of Deflected Nasal Septum. H. L. Warwick, Fort Worth.—p. 226.
152 Temporal and Subconjunctival Medication in Certain Eye Conditions. R. B. Sellers, Fort Worth.—p. 229.
153 Foreign Bodies in Trachea, Bronchi and Esophagus; Case Reports. J. L. Burgess, Waco.—p. 231.
154 Case of Typhus. H. L. McNeil, Galveston.—p. 234.

Wisconsin Medical Journal, Milwaukee

September, XV, No. 4

155 Some of More Common Diseases of Skin. O. H. Foerster, Milwaukee.—p. 105.
156 *Gastric and Duodenal Ulcer in Newborn. T. W. Nuzum, Janesville.—p. 111.
157 Nurse Midwife. F. J. Taussig, St. Louis.—p. 113.
158 Limitations of Surgery in Treatment of Pelvic Inflammations. P. Findley, Omaha.—p. 116.
159 *Eighty-Two Cultures Taken from Physicians' Clinical Thermometers. W. R. Ramsey and H. M. Schoberg, St. Paul.—p. 118.

156. **Gastric and Duodenal Ulcer in Newborn.**—Nuzum cites two cases of such ulcers occurring in infants. A strong healthy girl, 24 hours old, suddenly vomited some 2 or more ounces of blood after which she was very pale and weak and showed very marked symptoms of loss of blood. This occurred on two other occasions and she lay at the point of death for sometime. She finally rallied, made a slow recovery and up to the time she was 10 years old was a healthy fine girl. Nuzum is convinced that this was a case of gastric ulcer, which was present before birth and which started to bleed on account of the distention of the stomach by the mother's milk and consequent peristalsis, or by both. A fine baby girl cried lustily following a natural delivery, nursed well, and seemed well in every way until about 14 hours old when the nurse noticed a spot of blood on the diaper. Nuzum made a diagnosis of hemorrhage from a duodenal ulcer and instituted active treatment for the same, but to no avail. She continued to pass clotted blood during the night, went into collapse and died when 24 hours old. A postmortem was permitted. There was a firm band of organic adhesions about one-half inch wide extending from the ulcer site on the duodenum to the gallbladder, also some friable adhesions and a plastic exudate. A small quantity of blood had oozed through the perforation into the peritoneal cavity. The mucosa around the tiny ulcer was smooth and soft, not noticeably different from that in the normal parts.

159. **Cultures Taken from Clinical Thermometers.**—Total cultures taken by Ramsey and Schoberg were eighty-two. Of this number, thirty-three were sterile; forty-nine contained organisms of various kinds. Streptococci occurred in thirteen cultures. One thermometer which gave a pure culture of streptococci had been used in the mouth of a patient with facial erysipelas a few hours before and had been washed in water, and dipped in alcohol before returning to the case. Five others, from thermometers used in scarlet fever patients contained streptococci in large numbers. *Staphylococcus albus* and citrus were present in thirteen cultures. Pneumococcus occurred in one culture. The remainder had various organisms, large spore forming bacilli, hay bacilli, mould fungus, etc. The authors emphasize that careless washing will not suffice but that thorough washing with running water and then alcohol will render them clean. A thermometer case containing some solution such as alcohol or formaldehyd solution, in which the thermometer could be carried, would lessen greatly the possibilities of infection, as several thermometers were examined which were carried in this way and all were sterile.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

September 2, II, No. 2905

1 Distribution of Typhoid and Paratyphoid Infections Among Enteric Fevers at Mudros, October-December, 1915. C. J. Martin and W. G. D. Upjohn.—p. 313.
2 *Brilliant Green and Telluric Acid in Isolation of Typhoid-Paratyphoid Bacilli. A. Leitch.—p. 317.
3 *Local Treatment of Burns on Naval Hospital Ship. R. J. Willan.—p. 318.
4 Extension Treatment of Gunshot Fractures. E. W. H. Groves.—p. 320.
5 *Mechanism of Saline Dressings. K. Taylor.—p. 321.
6 Recent Epidemic Outbreaks of Acute Poliomyelitis. A. G. Robb—p. 324.
7 Three Cases of Bubonic Plague Arising in England. A. R. Short.—p. 327.

2. **Isolation of Typhoid-Paratyphoid Bacilli.**—For the isolation of typhoid-paratyphoid organisms from urine Leitch tried a slight modification of the Browning-Mackie method in 1,100 specimens. Equal quantities of urine and brilliant green peptone water (the dye being in a concentration of 1

in 100,000 in the latter) were mixed and incubated for twenty-four hours, and a loopful from each was spread on MacConkey plates. In only one case was an organism of the group isolated—a paratyphoid A. In almost all other cases the plates were sterile. Leitch regards the method of Browning, Gilmour and Mackie as a useful one in detecting a number of carriers of typhoid paratyphoid that are liable to be overlooked by the ordinary procedure. Both methods should be done together as a check on each other. Owing to the saving of time, if one method alone has to be used Leitch would use the brilliant green.

3. **Local Treatment of Burns.**—The treatment employed by Willan was as follows: The blisters were punctured and the contents drained under strict aseptic precautions, the surface being first sponged with phenol solution, 1 in 20. If it was a recent burn he applied the service picric acid dressing as the first dressing. Early sepsis in burns has an unmistakable odor, and the sense of smell can detect it early. If there was no smell the first dressing was left on for two days, when it was removed in order to puncture any further blisters which might have formed. An ointment was applied, made of equal parts of boric ointment and petrolatum. This was plentifully spread on strips of white "surgeons' lint," and was changed once daily. If the dressing had the septic smell the infected part was fomented with boric fomentations every four hours. The fomentation was four ply, and the covering jaconet projected for one-half inch beyond the margins of the fotus in order to keep in the moisture. When the area cleared up—that is, when all sloughs, etc., had separated and a clean surface was left—the above mentioned ointment was similarly applied once a day, according to the amount of pus which had been secreted from the raw surface. If the burn was aseptic the loose skin of the blisters was not removed, but was left to act as a protection to the exposed deeper and painful layer of the skin. If the burn was septic all loose skin was cut away. The dressing next to the skin was covered by wool containing a small amount of mercury perchlorid. The whole dressing was fixed by a bandage loosely applied. Face masks were not used except when a fomentation was required. With face burns the nose, cheeks and lips were frequently smeared with the ointment, which was gently massaged in with the convex surface of a teaspoon. Out of twenty-eight cases, fifteen were aseptic, and all these recovered. The remaining thirteen cases were septic to a greater or lesser degree, and five of them succumbed, but one of these had other serious injuries. Four of the cases were virulently septic, and two fatal cases developed erysipelas.

5. **Mechanism of Saline Dressings.**—What clinical evidence asks Taylor is there of the success of the treatment with hypertonic salt dressings? Aside from the claims of its author, there have been scattered reports in its favor appearing in various medical journals. There is also a strong minority which is disappointed in the treatment. It is claimed that the infection is not diminished and that the wound is left in poorer condition by its use than would have been the case if it had been left alone. Attempts are made to reinforce the weak antiseptic action of the high sodium chlorid content by the addition of a more active germicide. This is merely additional evidence that it has proved unsatisfactory. Taylor has seen it used rather extensively, and has not been convinced that it produced the results claimed for it. The saprophytic bacterial flora persisted quite as long as with the ordinary methods of antiseptic treatment, and the separation of sloughs did not appear to be appreciably hastened. He has in addition, felt that edema of the tissues around the wound occurred more frequentiy after the use of hypertonic saline than with other dressing solutions, possibly as the result of an increased deposit of salt. Furthermore, the recuperative reaction in the wound appeared to be retarded.

Indian Medical Gazette, Calcutta

August, LI, No. 8

8 Likewise and Contrary Wise. R. Bryson.—p. 281.
9 Diarrhea and Continuous Fever Due to Oysters. W. D. Keyworth. —p. 286.
10 Treatment of Trachoma by Excision of Tarsus and Tarsal Conjunctiva of Upper Lid. W. E. S. Moncrief.—p. 294.

Lancet, London

September 9, II, No. 4854

11 Analysis of Living Matter Through Its Reactions to Poisons. A. R. Cushny.—p. 459.
12 Study of Shell Shock. C. S. Myers.—p. 461.
13 *Effect of Trench Warfare on Renal Function. J. W. McLeod and P. Amenille.—p. 468.
14 Diagnostic Value of Tubercle of Choroid. S. Stephenson.—p. 472.
15 Trench Pyrexias; Their Prevention and Treatment. B. Hughes. —p. 474.
16 *Dressing of Septic Gunshot Wounds. W. B. Davy.—p. 475.
17 Case of Persistent Fever. G. L. Turnbull.—p. 476.
18 Bayonet Wounds of Chest. S. D. Rhind.—p. 477.
19 Shiah Pilgrimage and Sanitary Defences of Mesopotamia and Turco-Persian Frontier. F. G. Clemow.—p. 488.

13. **Effect of Trench Warfare on Renal Function.**—From the results obtained from the study of a considerable number of cases the authors are of the opinion that exposure alone has probably nothing to do with the causation of a number of the cases of nephritis observed in France, especially the milder ones; and that if it has a part in the etiology of the more severe cases it will be similar to that exhibited in many infectious diseases, namely, that of setting up a defective circulation in an organ so as to render it less capable of resisting bacterial invasion. Transitory albuminuria is very common among all troops, especially those making considerable physical efforts, and the majority of these albuminurias can be classed with the so-called "fatigue" albuminuria. There exist, especially among the British troops, an excess of cases of symptomless albuminuria apart from those just mentioned, which cannot all be classified as chronic nephritis and which probably correspond to the surprisingly mild type of nephritis which has been so often observed during this campaign among the British troops. Diet appears to be the most likely explanation of this excess of transitory albuminuria and mild nephritis and may also contribute toward the development of the more severe cases. In support of this last conclusion it may be pointed out: that the authors' experiments have demonstrated that the average soldier is consuming an amount of protein food in excess of his requirements, and is, therefore, throwing an undue strain on his excretory organs; that the relative rarity of acute nephritis among younger officers is generally admitted; and that the unusually numerous cases of gingivitis which come under observation probably indicate that the men are suffering to some extent from the restriction of fresh vegetable food, which is usual, and to some extent inevitable, for troops in the front line and not uncommon farther back.

16. **Dressing of Septic Gunshot Wounds.**—Davy is impressed with the fact that from a therapeutic point of view the dressing, or rather the redressing, of a septic wound is as unnecessary as, and much more harmful than the redressing of a wound that is expected to heal by first intention. A redressing is of diagnostic value only, and it is the last diagnostic test that should be applied. A redressing should be looked on as an operation only to be undertaken after careful thought, and an unnecessary dressing should be regarded with as much regret as an unnecessary operation. Most redressings are entirely unnecessary, and it is the better recognition of this that is Davy's plea.

Medical Journal of Australia, Sydney

August 12, II, No. 7

20 Fractures of Lower Extremity. R. H. Russell.—p. 107.
21 Intensive Specific Treatment of Epidemic Cerebrospinal Meningitis. D. A. Welsh and W. S. Brown.—p. 113.
22 Operation Specimen Containing Inflamed Appendix, Pyosalpinx, Hydrosalpinx, Fibrotic Uterus and Fibroid Polyp, Technic Employed. R. Worrall.—p. 117.

August 19, No. 8

23 Arsenobenzol Substitutes for German Salvarsan. E. H. Molesworth. —p. 129.
24 Danysz' "102" (Luargol) in Treatment of Malignant or Acute Syphilis. Dalimier and Levy-Franckel.—p. 130.
25 Pyorrhea Alveolaris. A. J. Wright.—p. 131.
26 Roentgenology and Radium Therapy Abroad. H. Harris.—p. 133.

Practitioner, London

September, XCVII, No. 3

27 *Abdominal Wounds in War. C. Wallace.—p. 201.
28 Recent Work in Orthopedics. E. R. Carling.—p. 232.
29 Recent Literature on Typhus. C. B. Ker.—p. 238.

30 Reaction of Child to Faulty Environment. H. C. Cameron.—p. 246.
31 *Gonorrhea Treated by Electrolysis; Results in One Hundred Cases. C. Russ.—p. 256.
32 Drug Progress. D. M. Macdonald.—p. 260.
33 Passive Ergotherapy in Obesity. J. S. K. Smith.—p. 264.
34 *Clinical Significance of Sinus Arrhythmia. L. T. Thorne.—p. 274.
35 Prognosis and Prophylaxis in Eclampsia. G. I. Strachan.—p. 279.
36 Bearer Work at Front. H. W. Spaight.—p. 288.

27. **Abdominal Wounds in War.**—The advisability of early operation, in the great majority of gunshot wounds of the abdomen, Wallace says, may now be said to be established on a firm basis. The question is now: What cases are best left alone? In a large series of cases there will be many that are past help. In 511 cases there were 145 in which any surgical operation was out of the question. Of the remaining 366 patients no operation was considered advisable in 56 instances. Of this latter number, 15 cases were, in all probability wounds of the liver. Some were cases of doubtful abdominal penetration, which arrived late, and presented no symptoms suggesting involvement of a hollow viscus. A few were cases of uncomplicated traumatic hematuria. Wounds of the liver furnish most of the cases of undoubted penetration which it is advisable to leave alone. The kidney furnishes a few as well, and about the propriety of leaving both these alone there is no difference of opinion. All are agreed, too, that wounds of the small gut area should be explored. There is still some doubt about the best course to pursue in cases of suspected stomach injury, and in wounds which apparently involve only the colon. A chart made of some hundreds of abdominal injuries shows that two thirds of the projectiles enter anterior to the lateral line of the body, when viewed from the front, and one third behind this line. On the whole, the posterior wound is the more dangerous. An anteroposterior wound in the upper part of the abdomen is the least dangerous, and a side-to-side wound lower down the most dangerous, though there is little to choose between the latter and anteroposterior hypogastric or buttock and hip wounds.

A chart made of a large series of cases that were too bad for operation, and in which a single entry wound was represented by a dot, and an in-and-out wound by a line, shows a darkened fan-shaped area, the apex of which is in the left costal margin. This chart seems to show that, of the cases that come under observation, the most dangerous wound is one of the left lower hypochondrium or upper lumbar region, for many such cases are too bad for operation. A chart with all the entrance wounds plotted shows a tendency for the dots to collect toward the sides of the body. This is probably connected with the presence of the great vessels in the mid line. Of the cases that arrive at the casualty clearing stations, wounds of the solid viscera are very much less fatal than those of the alimentary tube. When a fatal result ensues, the cause of death is, for the most part, hemorrhage. There is some evidence to show that wounds of the spleen and kidney vessels and of the liver veins are fatal before the cases reach the operation table. Wounds of the small intestine show a mortality of 63.8 per cent.; the large intestine, 60 per cent.; the stomach, 43.75 per cent.; while the total hollow viscera mortality is 64.5 per cent. This latter mortality shows the increased danger of multiple injuries, and is largely accounted for by colon injuries complicating those of the stomach and small gut. The small gut injuries are serious from their multiplicity, the large gut injuries from their infectivity.

31. **Gonorrhea Treated by Electrolysis.**—This series is composed of sixty-nine acute and thirty-one chronic cases. The average number of treatments required in the acute cases was sixteen (minimum = 5 and maximum = 34). In the chronic cases the average number of treatments necessary was twenty (minimum = 14 and maximum = 35), the duration of the disease in this group being from fourteen days to five years before commencing electrolysis. Besides treatment by electrolysis, Russ only uses vaccine for rheumatic cases, and orders a little sandalwood oil after the discharge has become slight.

34. **Clinical Significance of Sinus Arrhythmia.**—Thorne is convinced from observation of many cases in adults, especially young adults, that the presence of any kind of irregularity in the cardiac rhythm is not a normal condition, and that it should not be disregarded. People in whom arrhythmia is present are more liable to suffer from a cardiac breakdown, under mental or physical strain, than are those who have a perfectly regular pulse.

Sei-I-Kwai Medical Journal, Tokyo

August, XXXV, No. 8

37 Diabetes Mellitus Among Japanese. (To be continued.) S. Iwai. —p. 43.

Bulletin de l'Académie de Médecine, Paris

August 22, LXXVI, No. 33, pp. 121-136

38 *Plague in the Senegal. (Epidemie de peste qui a sévi à Dakar et au Sénégal d'avril 1914 à février 1915.) Kermorgant.—p. 126.
39 *Magnesium Hypochlorite in Surgery. Dubard.—p. 134.

August 29, No. 34, pp. 137-162

40 *Results of Vaccination Against Typhoid in the French Navy. A. Chantemesse.—p. 140.
41 *Inexpensive Substitutes for Butter, Lard and Olive Oil. (De l'utilisation de nos corps gras coloniaux, pour remédier à l'insuffisance de nos corps gras métropolitains.) E. Maurel.—p. 145.
42 Lip Reading for Deafness from Wounds in War. (La surdité de guerre bilatérale totale: Rééducation auditive ou lecture sur les lèvres.) M. Lannois and F. Chavanne.—p. 150.
43 Simplified Artificial Leg. (Note sur quelques appareils nouveaux de prothèse du membre inférieur.) T. Tuffier and Seron.—p. 159.

38. **Plague in Western Africa.**—Kermorgant gives the details of a bubonic plague epidemic in the Senegal from April, 1914, to February, 1915. The natives concealed their sick at first and the epidemic thus got a foothold. During the nine months there were recorded 8,686 cases of plague, with a known mortality of 1,425 cases; the population totals 20,000. Among the Europeans there were only seven cases with three deaths. The entire civilian population of the towns affected were vaccinated three times and all bore it well. At Dakar 8,000 natives were given a total of 13,596 vaccinations and throughout the Senegal 129,752 vaccinations were made. The children had the disease in the mild ambulant, bubonic form. A campaign against rats was undertaken with periodical "sulphuration" of the sewers, besides the use of traps, poisons, bounties and rat virus. There was an abnormally high mortality during the period of the epidemic in dogs, cats, rabbits, poultry and monkeys in captivity. The cattle and horses also died off in large numbers. No explanation for this high mortality could be found except that it was traced to plague bacilli in two cats, one monkey and a tame civet cat. The epidemic at Dakar was apparently stamped out twice and flared up again, so there were really three epidemics.

The natives like to bury the dead in the midst of their villages, and consequently a systematic transference of the natives to new villages was an important part of the campaign. The site of the old villages was burned over with huge bonfires and walled off with logs, stumps and brush. No one was allowed to return to them or cultivate the ground. The plague in this epidemic seemed to have been communicated by man to the rats of the region as no infected rats were found until late in the epidemic. As soon as the suspects were isolated and the contaminated huts burnt down scarcely any new cases developed. The first cases were of the pneumonic type, fatal in less than three days. Under serotherapy and camphorated oil the less severe bubonic type was successfully combated when the case was seen in time or the patient had been vaccinated against plague.

39. **Magnesium Hypochlorite in Surgery.**—Dubard commends in high terms a 1 or 2.5 per cent. solution of magnesium hypochlorite as absolutely harmless while its bactericidal power is considerable, and its preparation simple and inexpensive. As a disinfectant for the wounded it is proving superior to any others yet known, including Dakin's fluid. He commends it especially to obstetricians and midwives.

40. **Vaccination Against Typhoid in French Navy.**—Chantemesse states that there have been only 136 cases with 7 per cent. mortality among the 80,000 men who were vaccinated, while there were 525 cases with mortality of 14 per cent. among 60,000 not vaccinated. The figures include the

entire period of the war, and both typhoid and paratyphoid. Only one fatal case of typhoid occurred in a man who had been completely vaccinated, and in this case staphylococci were isolated from the meninges. Three of the fatalities were from paratyphoid. Two whole pages of this report are blank, the contents having been struck out by the censor.

41. **Substitutes for Butter and Lard.**—Maurel shows that according to general habits the daily allowance of fat consumed is about 1 gm. per kg. of the normal weight of the adult. About half this amount is eaten in the form of meat, milk and eggs, the other half being taken to add savor to dishes. "There is such a scarcity of fats now," he says, "that there is actually a famine in fats. The census of hogs in France, Dec. 31, 1913, showed 7,047,750 head, but in July, 1916, there were only 4,448,366, a falling off of 36 per cent., and the price of lard has risen accordingly." He urges that greater use should be made of peanut oil and coconut oil which are produced in abundance in the French colonies in Africa. They are wholesome, inexpensive, and entirely satisfactory for cooking and salad oils, as he has long proved at his own table.

Paris Médical

August 19, No. 34, pp. 149-164

44 *Factitious Phlegmons and Jaundice to Escape Military Service. (Maladies provoquées ou simulées en temps de guerre.) Chavigny.—p. 150.

45 Filiform Drainage of Infected Fractures. (Le drainage des fractures de guerre infectees et le traitement des pseudarthroses.) H. Chaput.—p. 153.

46 Devices for Auto-Extension of Fractured Limb. L. Senlecq.—p. 156.

47 Bloodletting Without Venesection. (La saignée sans phlébotomie.) L. Plantier.—p. 160.

48 Lesions in the Bones Not Discoverable by Roentgenoscopy. (Lesions osseuses non décelables par la radioscopie.) R. De Labarie.—p. 162.

44. **Factitious Phlegmons.**—Chavigny says that there is no really scientific irrefutable proof that can be advanced to show that a given phlegmon is not a natural process but has been induced by artificial means. This is generally subcutaneous injection of turpentine or gasoline. The fact that they occur in epidemic form and on the same part of the body is presumptive evidence of fraud. The injection of turpentine and gasoline leaves no traces on the skin, and the redness, heat and tumefaction are the same as in the most respectable phlegmon, but there is less pain and there is no glandular involvement. Fluctuation is pronounced the fourth or fifth day but the turpentine phlegmon contains little or no pus, only a mass of gangrenous scraps of subcutaneous cellular tissue. The pus of a gasoline phlegmon is a whitish thick jelly. The petroleum abscess smells strongly of petroleum. All these substances destroy bacteria so the pus is aseptic.

44. **Jaundice from Injection of Picric Acid.**—Chavigny's tests have apparently demonstrated that picric acid dust, inhaled in the manufacture of munitions, etc., does not pass into the urine and it is not used to adulterate foods enough to have it show in the urine. Hence when it is found pronounced in the urine in persons subject to military duty, this is presumptive evidence that it was taken to induce the jaundice which always follows.

Presse Médicale, Paris

August 31, XXIV, No. 48, pp. 381-388

49 *Infectious Icterus with Febrile Recrudescences. M. Garnier.—p. 381.

50 Improved Auto-Extension and Immobilization Apparatus for Compound Fracture of Femur. (Le traitement des fractures compliquées de la cuisse par un appareil réalisant toutes les conditions désirables pour la thérapeutique de pareilles blessures.) J. Ducuing.—p. 383.

49. **Infectious Jaundice with Febrile Recrudescence.**—Garnier calls attention to the febrile recrudescence which is a special feature of certain cases of infectious jaundice. It must not be mistaken for a febrile complication, as it is merely part of the disease. In a typical case related, after a week of apyrexia, during which the pulse had returned to normal and the amount of urine was approximating normal, the temperature ran up high again and kept febrile from the twelfth to the twentieth day of the jaundice, the high plane of the temperature suggesting typhoid while the general condition grew worse again, but the jaundice showed no aggravation, although the urine grew darker in color and scantier in amount. The liver evidently suffered during the febrile recrudescence, but not to such an extent as during the onset of the disease. The cyclic recrudescence in several cases cited might be superposed, the curves being so much alike. Study of the blood in twenty-three cases revealed paratyphoid B in one case but in the others the blood seemed to be sterile.

Revue de Chirurgie, Paris

April, XXXV, No. 4, pp. 481-635

51 *Emergency Treatment of Wounds of the Joints. (Le traitement des plaies articulaires dans les ambulances.) A. Schwartz and P. Mocquot.—p. 481.

52 *Shell Wounds of the Knee. (Plaies pénétrantes du genou. Résultats obtenus pendant un an (1914-1915) à l'hôpital de Commercy.) J. Martin.—p. 587.

53 Remote Results of Operative Treatment of War Wounds of Nerves; Fourteen Cases. A. Basset.—p. 609. To be continued.

51. **Emergency Treatment of Wounds of Joints.**—Schwartz and Mocquot devote over 100 pages to analysis of eighty-seven cases of war wounds of the knee, wrist or ankle, with the ultimate outcome after operative treatment in the ambulance. They comment on the wide range of the injuries that may be induced, from the simplest to the most mutilating and infected, and discuss the diagnosis and indications with each type.

52. **Shell Wounds of the Knee.**—Martin analyzes thirty cases of shell wounds of the knee encountered among 3,000 wounded soldiers who have passed through his hands. The hole made by the projectile permits more or less complete drainage so there is none of the pain and swelling we are accustomed to with a knee affection outside of war conditions. The temperature running up may be the only sign of the gravity of the case. In the early months of the war Martin followed the traditional methods, arthrotomy, resection for arthritis persisting after drainage, amputation. The disastrous results forced a change to systematic exploration of the joint and early resection when found necessary, and at once the outcome became immeasurably better, with no mortality, while 42 per cent. died of the nineteen cases in the first group.

Revue Médicale de la Suisse Romande, Geneva

August, XXXVI, No. 8, pp. 449-536

54 *Tuberculosis and the School. (Tuberculose et école.) L. Jeanneret.—p. 449.

55 *When Shall We Operate in Gallstone Trouble. (Les indications opératoires de la lithiase biliaire.) G. Patry.—p. 479.

56 Tumor in Cerebellopontine Angle in Woman of Sixty-One. H. Preisig.—p. 510.

54. **Tuberculosis and the Schools.**—Jeanneret declares that it is at school and by the school that society can root out tuberculosis. The physician has not only the right, it is his duty to utilize the school because it is here only that effectual prophylaxis can be applied. If there is no case of open tuberculosis in the environment, the infant may escape infection. Between 3 and 5 the lymphatic glands arrest any tubercle bacilli entering the organism. This localization in the glands may be the extent of the tuberculosis invasion. The child is not diseased, he is merely tuberculized, sensitized. The organism keeps on the defensive and gives a positive response to the tuberculin tests all through life, up to advanced age, testifying to a relative immunity. We can assume that practically every child is infected before it reaches 15. It is our task to distinguish between those who are holding their tubercle bacilli harmlessly imprisoned in their glands, and those whose bacilli are more active and flood the blood stream now and then with their toxins. The child does not develop normally, looks frail and the digestion is deranged, gastric anachlorhydria leading to intestinal trouble. These *tuberculisés évolutifs* are the candidates for phthisis in later life.

Jeanneret emphasizes that tuberculosis in schoolchildren is always "closed." The children do not infect each other. They contract the disease in their homes or from the teacher. Every schoolchild should have his health chart, the *fiche sanitaire*. On this should be recorded his weight every month and his height twice a year. The weight divided by the height gives a reliable index of the physiologic balance. The

health chart should also record the tint of the mucous membranes, and whether the child is pale or ruddy, a good or bad student, and likewise any complaints or anomaly that may be noticed. The Pirquet skin test is indispensable. Once positive, it need not be repeated but, if negative, it should be repeated once a year. With health cards like this, kept up to date, the children with evolving tuberculosis are automatically sifted out, and these require closer examination, including roentgenoscopy.

Jeanneret regards sunlight as the great regenerator in childhood. He has the children's gymnastic work done in the open sunlight, the children stripped to the waist. (His success with "outing sunbaths," preventive heliotherapy, was described in these columns, June 17, 1916, p. 2043.) This idea of exercising with the upper part of the body exposed to the air has spread until now the Swiss soldiers systematically exercise in this way. He adds that gymnastic exercise for children from 6 to 12 should be predominantly thoracic. The child has special need of oxygen, and the only means to increase the supply of oxygen is by developing the respiratory function by gymnastic exercises of the chest. This develops the chest and lungs, keeps the costal articulations flexible, and thus materially reduces the predisposition to tuberculosis. Training of deafmutes in phonetic exercises has aided much in reducing the predisposition to tuberculosis in this group. Fully an hour in the course of the day should be devoted to gymnastic exercises in every school. He describes ten basic exercises: one is to place the hands on the abdomen, the forefingers meeting at the umbilicus. Take a slow deep breath, pressing on the abdomen, then releasing it under slow expiration. The exercises with the arms and trunk are done to correspond with deep inspiration, letting the arms fall or raising the trunk during expiration. The last exercise on his list is bending forward until the palms can touch the floor, then raise the body during inspiration and bend over again during expiration.

55. **Indications for Operative Treatment for Gallstones.**—Patry expatiates on the importance of distinguishing between the various factors causing disturbances from the presence of gallstones. Some require operative measures and others do not. On the whole, he declares, the general treatment of lithiasis is medical. Operative treatment should be reserved for cases of acute angiocholitis; acute cholecystitis when the symptoms indicate that the infectious process is spreading; and a stone impacted in the common bile duct when the liver shows signs of alteration. In all other types of gallstone trouble the decision whether to operate should be left to the patient. One can count almost absolutely on a complete cure and with the minimum of risks if the general condition is good.

Correspondenz-Blatt für Schweizer Aerzte, Basel

August 26, XLVI, No. 35, pp. 1089-1120

57 Methylene Blue and Methyl Violet as Local Disinfectants. (Beitrag zur Therapie mit Anilinfarbstoffen.) E. Baumann.—p. 1089.
58 *Cases of Myoclonia Epilepsy. P. Wolfer.—p. 1105.

58. **Myoclonia-Epilepsy.**—Bührer published in 1901 a case of myoclonia-epilepsy in a girl of 18, and Wolfer here describes another case, in a boy of 15, the brother of the girl. Another sister has seizures but no myoclonus. Neither of the cases of myoclonia offer any further bases for theories as to the etiology. It seems probable, however, that both the peripheral and central nervous system and the musculature are functionally damaged as a family trait. No benefit was derived from any treatment except transient relief from sedatives.

Gazzetta degli Ospedali e delle Cliniche, Milan

August 24, XXXVII, No. 68, pp. 1057-1072

59 Mode of Action and Indications for Autoserotherapy. (Studio preparatorio per conoscere il meccanismo di azione e le indicazioni della auto-siero-terapia.) E. Belliboni.—p. 1058.

August 27, No. 69, pp. 1073-1088

60 *Subphrenic Abscess; Six Cases. A. Franchini.—p. 1074.

August 31, No. 70, pp. 1089-1104

61 *Diagnosis of Asiatic Cholera. F. Pancrazio.—p. 1090.

60. **Subphrenic Abscess.**—Franchini reports six operative cases of subphrenic abscess, and ascribes his success in all to the avoidance of general anesthesia and the scrupulous after care, but above all to the convenient mode of access he followed. He resected the tenth rib from the back and incised the parietal pleura for 8 or 9 cm. The lips of the incision were then sutured in a circle to the bulging portion of the diaphragm pushed up by the abscess. An incision in the diaphragm released the pus and gas of a fecal odor. The cavity was cleared out and dried with gauze and two large drains introduced. The woman for some time before the abscess had had symptoms of acid gastritis. In some cases he sutured to the skin the lips of the incision in the diaphragm. In a few of his cases the abscess was accompanied by pleural effusion, percussion showing the resonance of the lung, then the dulness over the pleural effusion, below this an area of tympanitic resonance and below this the liver dulness.

61. **Diagnosis of Cholera.**—Pancrazio remarks that while the diagnosis of cholera is usually self-evident, yet occasionally cases are observed in which the syndrome deceptively simulates acute poisoning and others in which it is so mild that cholera is scarcely suspected. He has had cases in which bacteriologic tests were repeatedly negative and even after death the cholera vibriones were found only in the bile. The mild cases are particularly puzzling, especially when cholera is not epidemic. The essential feature of cholera, he declares, is the more or less intense intoxication of the organism. This alone explains the fulminating cases in which the diarrhea and vomiting are extremely mild throughout, but necropsy discloses serious lesions in the kidneys, liver and heart. The asthenia and the changes in the voice are best explained by this assumption. These, with the diarrhea without pains and without meteorism, warn of cholera; they are all usually present even in the mildest cases. When Pancrazio notices sudden, extreme weakness, even without other symptoms, he begins to investigate at once whether there has been any liability to contact with cholera.

Policlinico, Rome

August 27, XXIII, No. 35, pp. 1043-1066

62 *Asepsis versus Antisepsis in Treatment of Wounds in War. (Intorno alla cura delle ferite settiche.) G. Ruggi.—p. 1043.

August, Surgical Section No. 8, pp. 225-256

63 Pyogenic Obligatory Anaerobic Bacterium Found in a Compound Fracture. (Bacillus putrificus var. non liquefaciens.) F. Putzu.—p. 225.
64 *Experimental Research on Cutting Wounds of the Kidney and Reimplantation of Severed Segment. (Sulle estese ferite di taglio del parenchima renale e sul reimpianto di segmenti renali.) G. Serafini.—p. 236.

62. **Asepsis in Treatment of Infected Wounds in War.**—Ruggi's many years of experience have convinced him that the extremely complicated and delicate natural processes of defence and repair in an infected wound are best promoted by first clearing out the wound and providing ample drainage and then leaving it absolutely alone. Any pressure in the wound, either from accumulation of secretions or by movements increasing the pressure, changing dressings, exploration, palpation, all tend to disturb the delicate biologic processes going on in the wound, and not only spread the germs around in the wound but spread them so they will invade the rest of the body or their toxic products thus be disseminated. Even the slightest displacement of any of the tissues in the wound permits germs to proliferate in the intervening spaces, in the lymph spaces and along the tendon sheaths, etc., thus permitting the germs to get into the arterioles or finer ramifications of the veins. The aim in treatment therefore should be to prevent the formation of a closed cavity, open it if already formed, and ensure ample drainage of all its recesses, keep the injured limb absolutely still with immobilizing apparatus and change the dressings only when absolutely necessary. In his service, the dry aseptic gauze applied to the thoroughly drained wound is left untouched unless pain, hemorrhage or rising temperature call for its renewal. Whenever the temperature runs up abruptly to 38 C. (100.4 F.), cautious examination of the

wound will show then some obstruction of drainage and the temperature drops when this is remedied. The temperature may run up abruptly and drop soon again even after a change of dressings, merely from some of the toxic products being absorbed in the course of the manipulations. He does not use any antiseptics except for the mouth and for much soiled wounds seen at once. Those reaching him at Bologna have passed the stage when this would be effectual. He cites a few typical charts, including one of a soldier seven days after comminuted fractures of the humerus, radius and ulna of the right arm. Amputation seemed inevitable as the devastation of both bones and soft parts was enormous; the whole was opened up, drained with gauze, and a dry gauze dressing applied, with plaster immobilization of the arm. The temperature was not permanently normal until the fortieth day. During the first phase, with predominant remissions of the fever, the dressings were changed seven times in the course of the twenty-seven days, and the plaster cast three times. During the thirteen days of the second phase, the intermissions of the fever predominating, the dressings were changed three times and the plaster once. The chart shows that each fever peak was followed by a change of the dressings and this by an abrupt decline. After the first week, two weeks passed before the dressings required changing, except the outer layers for cleanliness. His remarks apply only to the material in his service at Bologna, which is not reached by the wounded until several days after their injury.

64. **Cutting Wounds of the Kidneys.**—Serafini's experiments were made on rabbits and demonstrated that the kidney can be smoothly cut and sutured again without much damage provided the line of cleavage is parallel to that of the vessels of the parenchyma or, if slanting across the plane of the vessels of the parenchyma, if the lesions are not too extensive and too deep. If the cut extends half through the kidney the attempt to preserve the part of the kidney below may prove disastrous. Resection is indicated here; it leaves a functionally capable stump of the organ. These statements apply only to smooth cuts; when there is contusion with crushing of tissues nephrectomy is usually indicated. None of the twelve animals died in consequence of the smooth cut or developed infiltration with urine or perirenal hemorrhage. A few stitches or turning in of the lips of the wound prevented complications, even when the cut had extended into the kidney pelvis. Few traces of the deep incision were left when it was parallel to the vessels of the parenchyma, but extensive zones of necrosis developed below when the vessels had been cut. In his experiments on five rabbits with reimplantation of the segment cut off from the kidney, the implanted portion always crumbled or mortified or softened into an amorphous mass.

Siglo Medico, Madrid

August 19, LXIII, No. 3271, pp. 529-544

65 *Diagnosis and Treatment of Glaucoma. A. Barraquer.—p. 530.

65. **Diagnosis and Treatment of Glaucoma.**—Barraquer says that there are hundreds of victims every year in Spain because the general practitioners fail to recognize glaucoma. When it develops in an acute form with vomiting and headache, they ascribe it to deranged digestion with casual neuralgia. When it develops insidiously, in a chronic form, it is mistaken for senile cataract. He urges that medical students should be trained especially in diagnosis of acute glaucoma, iritis and cataract, and in the advice to give patients with squint and myopia to ward off aggravation. Students should also be taught to recognize asthenopia and the ocular origin of dizziness and headache in some cases, and the relations between disturbances in vision and disease of the various organs outside of the eye. The practitioner is often misled when a patient in bed for any trouble or one coming to the office complains of intense headache and states that he has just had an attack, cannot sleep, has no appetite, and cannot see well. The pulse is accelerated, the tongue coated and the eyelids are swollen, the eyes bloodshot and lacrimating, with mydriasis and diminished depth of the anterior chamber—all coming on within a few days. The hyperemia, pushing forward of the lens and iris and the fogginess of the general vision are the revealing symptoms of glaucoma and should exclude simple neuralgia. Equally important is it to detect glaucoma in its prodromal stage, from the colored halo around the flame of lamps or candles, with transient feeling of oppression over the eyebrows. This condition may be mistaken for ophthalmic migraine, but there is no headache with this insidious type of glaucoma, and the symptoms persist longer than with migraine.

Russkiy Vrach, Petrograd

XV, No. 27, pp. 625-648

66 Opening Address at First Annual Meeting of Russian Radiologists. O. D. Khvolson.—p. 625.
67 *Study of the Biologic Action of the Roentgen Rays. (K voprosu o biologicheskom dieistvii Roentgen'ovskikh lutchei.) M. I. Nemenoff.—p. 629.
68 Cysts of the Prostatic Vesicles. G. I. Baradulin.—p. 632.
69 War Wounds of Bladder. (Ognestrielniya raneniya mochevogo puzirya.) S. L. Timofieff.—p. 633. Commenced in No. 25, p. 578.
70 War Wounds of the Skull. V. V. Lavroff.—p. 636. Concluded in No. 29.—p. 683.
71 *Galvanometer as Substitute for Clinical Thermometer. (Novii sposob izmiereniya temperaturi cheloviecheskago tiela: primienenie termoelementa i galvanometra.) D. N. Sholaster.—p. 640.

No. 29, pp. 673-696

72 *Pathogenic Importance of Tenia Nana. Relation of Helminthiasis to Epileptiform Attacks. (O patologicheskom znachenii karlikovago tziepenya.) A. E. Shtsherbak.—p. 673.
73 *Dietetic Treatment of Gastric Hyperacidity. (O vozmozhnosti ponizit kislotnost zheludochnago soderzhimago dietoi.) P. I. D. Sushtshevskaia.—p. 679. Commenced in No. 28, p. 656.
74 War Wounds of the Skull. (Ob . . . raneniakh cherepa. Habliudeniya za I-ui god voeni.) V. V. Lavroff.—p. 683. Commenced in No. 24, p. 560.
75 Radiotherapy of Uterine Cancer. (O lieehenii radioaktivnami veshtshestvami raka matki.) V. A. Polubinski.—p. 689.

67. **Biologic Action of the Roentgen Rays.**—Among the results of the experiments on dogs related by Nemenoff, is the striking proliferation of the interstitial cells and the cells of the prostate gland when the testicles were exposed to the Roentgen rays. He explains this by the fact that the Roentgen exposures do not modify the supply of nourishment to the testicle, and as the generative cells, the cells of external secretion, are destroyed under the influence of the rays, the other cells get the benefit of the nourishment which otherwise would have gone to the generative cells. He agrees with Bouin and Ancel that the interstitial cells are the ones responsible for the internal secretion and the secondary sexual characters. Castration, by removing the whole of the testicle, sweeps away both the external and the internal secretion, but exposure to the Roentgen rays annuls the germinative function fully as effectually, while not interfering with the internal secretion unless by increasing it, owing to the better nourishment of all the cells outside of the oversusceptible generative cells.

Of course it is impossible to apply directly to man the results of experiments on animals, but these striking phenomena involuntarily suggest a connection with the proliferation of the cells of the prostate in the elderly. This hypertrophy of the prostate occurs exclusively at that period of life when the genital functions usually are dying out. His research shows that Wilms' suggestion to treat it with Roentgen exposures is directly contraindicated. He recalls further the temporary retrogression of mammary tumors and the subsidence of uterine myomas after ovariectomy, and the atrophy of the prostate liable to follow castration. On the basis of these and other data cited, he propounds the following question: "If the dystrophy induced by Roentgen exposures of the testicle can lead to hypertrophy of the elements of internal secretion and this to proliferation of the parenchyma of the prostate, is it not possible that the growth of benign and malignant tumors may also be the result of atypical proliferation of tissues under the influence of dystrophy of certain elements in glands with an internal secretion?"

71. **Galvanometer as Substitute for Clinical Thermometer.**—Sholaster relates that maximal thermometers are extremely scarce in Russia just now and very expensive, and he

describes a method with which it is possible to register the body temperature with two wires attached to a galvanometer.

72. **Pathogenic Importance of Dwarf Tapeworm.**—Shtsherbak relates the history of a girl of 8 who presented what was assumed to be chronic true epilepsy. This was the verdict of several neurologists and pediatrists who were consulted. They made apparently thorough examinations, searching the stools for helminths' eggs on several occasions but never finding any. This diagnosis proved to be erroneous, as the trouble was finally traced to the presence of tenia nana. He knows of only thirty-six clinical cases on record of the tenia nana as parasite in man, and 11 were published in Russia. Analyzing the nervous manifestations in his case, throughout the entire long history of the disturbances there was evident a combination of epilepsy, hysteria and migraine. Some of the attacks seemed to be exclusively an epileptic seizure or a hysteria fit or an attack of migraine or various combinations. This suggested helminthiasis, and the stools were examined anew but nothing abnormal was found on repeated examination, but the third examination showed the eggs of the tenia nana and after the child had been finally freed from the parasites her nervous system recovered its tone and there has been no further "epilepsy" during the nearly six years to date. Thymol proved the most effectual of the drugs used in expelling the parasites, but male fern was used freely also, as is described in detail.

73. **Cure of Hyperacidity by Simple Dietetic Measures.**—Sushkevskaia relates five cases in minute detail to demonstrate that it is possible to train the deranged stomach into approximately normal functioning by long continued dieting, even with the restricted resources of rural practice. She refers in particular to hyperacidity.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

August 26, II, No. 9, pp. 705-804

76 *"The Preclinical Courses in Medical Schools. (Inrichting van het pracclinische onderwijs.) G. van Rijnberk.—p. 705.
77 *"Physiology of the Lacrimal Passages. II. (Over zelfstandige vasomotorische drukschommelingen in het traankanaal.) G. F. Rochat and C. E. Benjamins.—p. 711.
78 *"Epilepsy and Dipsomania. G. C. Bolten.—p. 731.
79 Case of Abnormal Volitional Movements of the Eyes. (Een geval van abnormale willekeurige oogbeweging.) W. Koster.—p. 748.
80 *"Pathogenesis of Paroxysmal Hemoglobinuria. P. Daniels.—p. 753.

76. **Medical Education.**—In this third article on this subject, van Rijnberk translates nearly in full, with running comment, L. F. Barker's address, "Relation of the Preclinical Courses to the Work of the Clinical Years," published in THE JOURNAL, Feb. 26, 1916, p. 631. Van Rijnberk's final comment is in the words *Fiat votal* by which he evidently means "devoutly to be wished, but not much hope of being realized!" (See also Abstract 52, p. 1051.)

77. **Physiology of the Lacrimal Canals.**—Rochat and Benjamins report extensive research on the rabbit lacrimal apparatus, its relation to the respiration rhythm, its peristalsis under normal conditions, under the influence of nicotin, and under stimulation applied to the depressor and other nerves. There seems to be a vasomotor automatism of central origin. They locate this center in the floor of the fourth ventricle, controlling the lacrimal canal on the same side.

78. **Epilepsy and Dipsomania.**—In this third study of certain aspects of epilepsy, Bolten discusses its relation to dipsomania. He concludes its eighteen pages with the statements: "Dipsomania is a symptom complex that is caused by periodically recurring dysphoria. All troubles and disturbances on a basis of degeneration may induce it, so that hysteria, neurasthenia, epilepsy, and all degenerative and psychopathic conditions may bring on dipsomania. . . . Many cases of dipsomania belong to the group of mild manic-depressive psychoses. The depression is the immediate cause. The dipsomaniac does not drink because he enjoys drinking but because he wants to overcome his dysphoria, and hence he may use alcohol, cocain or narcotics. He has no special craving for alcohol, but only for something to drive away the blues."

80. **Paroxysmal Hemoglobinuria.**—Daniels reviews what has been written to explain the pathogenesis of paroxysmal hemoglobinuria, and points out that clinical experiences do not sustain the assumption that the trouble is of the nature of anaphylaxis. In both there is leukopeny, lymphocytosis, and reduction of complement, with clinical manifestations and falling blood pressure, but with anaphylaxis the temperature drops while it rises with paroxysmal hemoglobinuria and the blood coagulates extra fast, instead of coagulation being retarded, as with the anaphylactic shock. On the other hand, there is much to sustain the assumption that the blood in these cases contains a hemolytic amboceptor, an autohemolysin, which is the cause of the phenomena when it becomes activated by an especially low temperature.

Hygiea, Stockholm

LXXVIII, No. 15, pp. 1089-1184

81 *Intermeningeal Hemorrhage at Birth with Meningitis from Bacillus Subtilis. (Meningealblodning med infektion av B. subtilis hos ett spätt barn.) G. Lindberg.—p. 1089.
82 *Nonoperative Treatment of Hemorrhoids. (Några ord om hemorroidbehandlingen med suppositorier.) V. Berglund.—p. 1113.
83 *Cholesteatoma Removed from Frontal Sinus. (Ett fall av cholesteatom i pannhålan.) A. Haggstrom.—p. 1122.

81. **Intermeningeal Hemorrhage and Its Infection in Young Infant.**—Lindberg relates that a six weeks' babe was brought to the children's clinic at Stockholm with symptoms of purulent meningitis. The child had been born two weeks before term, and weighed 4,050 gm. The circumference of the head was 35 cm. Delivery was spontaneous after four hours of labor, but intermeningeal hemorrhage occurred and purulent meningitis developed. Puncture on each side of the anterior fontanel revealed pus, apparently restricted to the subdural space of the right hemisphere. An incision along the right coronal suture evacuated a large amount of thick, somewhat malodorous pus, and the circumference of the head was reduced by 2.5 cm. as about 150 c.c. of pus was thus removed. The immediate results were good, after the shock of the operation had been overcome. A serous discharge kept up and the appetite and weight improved, but the meningitis spread to the base of the brain and the child died sixteen days after the operation. A bacillus was found constantly in the pus in pure culture and also in the blood in the heart after death, which conformed in every respect to what we know of the *Bacillus subtilis*. He knows of only one case on record of fatal subtilis infection, and the few other clinical cases of subtilis infection on record were all in adults. Lindberg compares this case with others on record. Necropsy in his case showed that the operation had answered its purpose. In that region there was only serous fluid in the subdural space. The meningitic changes found at the base of the skull were of a later date. If the infection had been less virulent or the operation had been done earlier, the child might have recovered. No portal of entry for the infection could be discovered. It is possible that it was derived from the bowels by way of the blood.

82. **Nonoperative Treatment of Hemorrhoids.**—Berglund shows that suppositories, as generally used, are held back by the inner muscular ring and do not touch the hemorrhoids proper. There is thus little if any medicinal action from them. This is obviated by shaping the suppository to taper from the widest point near the upper end, and apply pressure to drag it down into the hemorrhoid region. This he accomplishes by hooding the suppository with a compress. It is placed in the center of the compress and thus hooded it is inserted in the anus, the ends of the compress hanging out of the anus and exerting sufficient pressure to hold the suppository down in the hemorrhoid region while the melting medicinal substance acts on the hemorrhoids, and any that escapes from the anus is caught on the compress ends below.

83. **Cholesteatoma in the Frontal Sinus.**—A physician of 39 noticed that his right eye was gradually becoming displaced, but there were no visual disturbances nor abnormal secretion, only at times he had headache restricted to the brow over the right eye. The trouble proved to be a cholesteatoma in the right frontal sinus, which it had enlarged, destroying the walls on the side of the brain and orbit and pushing the latter downward and outward. The growth was successfully removed through an incision in the brow.